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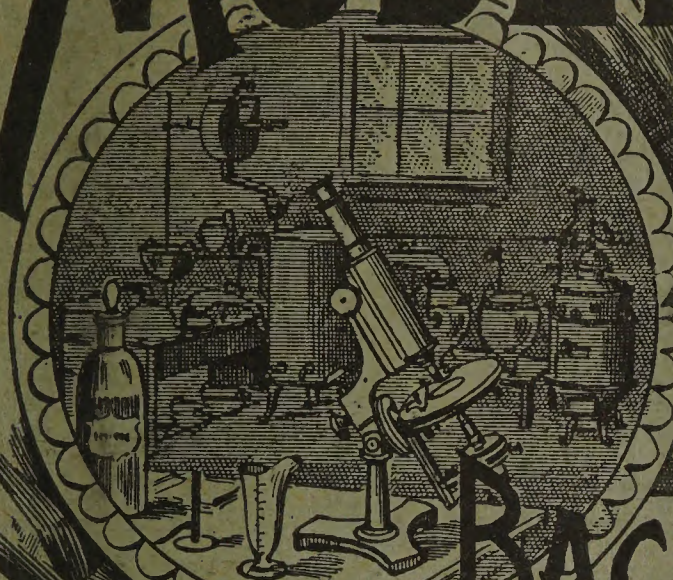
MODERN MEDICINE AND BACTERIOLOGICAL REVIEW.



Bulletin of the Sanitarium Hospital and Laboratory of Hygiene.
SANITARIUM, BATTLE CREEK, MICH.

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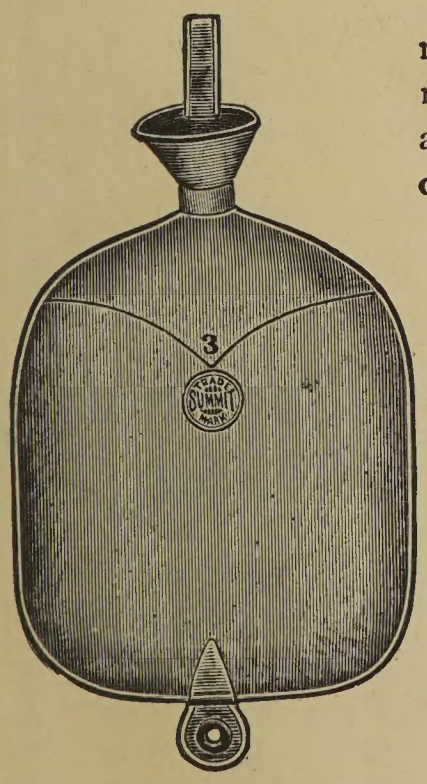

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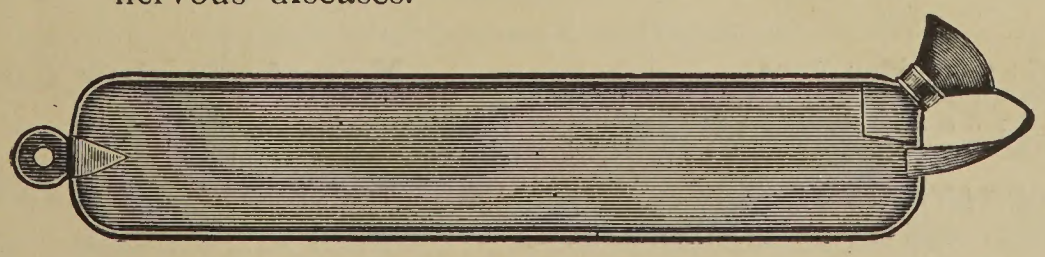

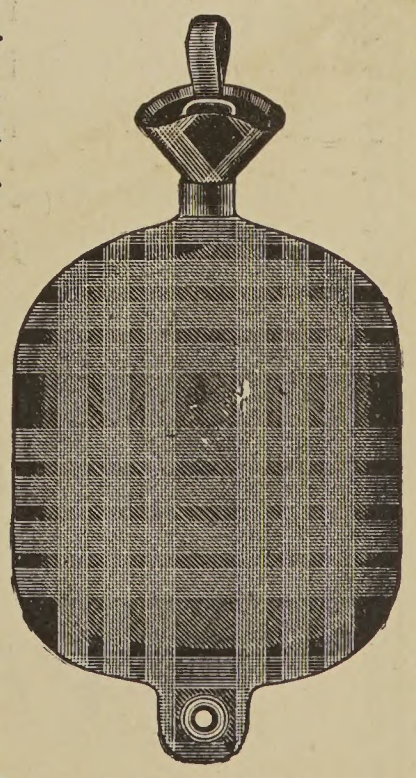

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p m										
1.10	6.15	12.00	10.05	.....	.....South Bend.....	2.35	10.40	5.55	.....	3.07
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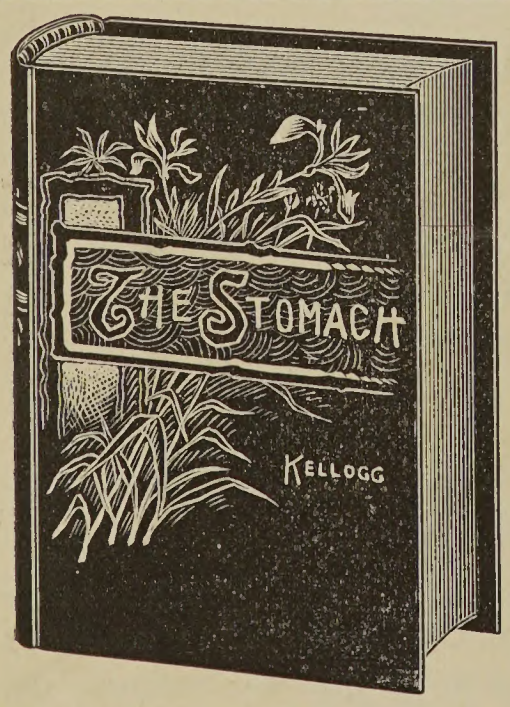

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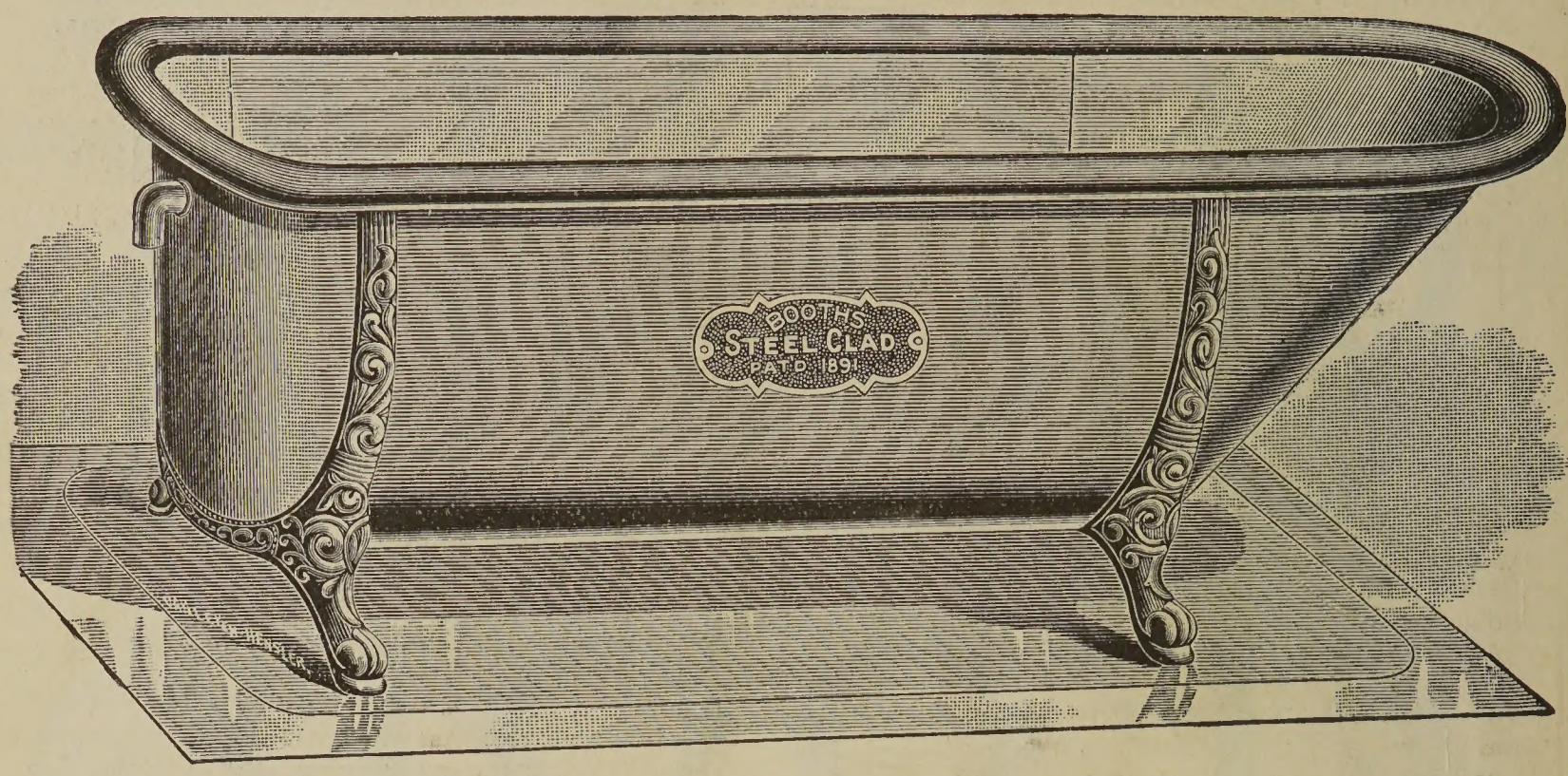

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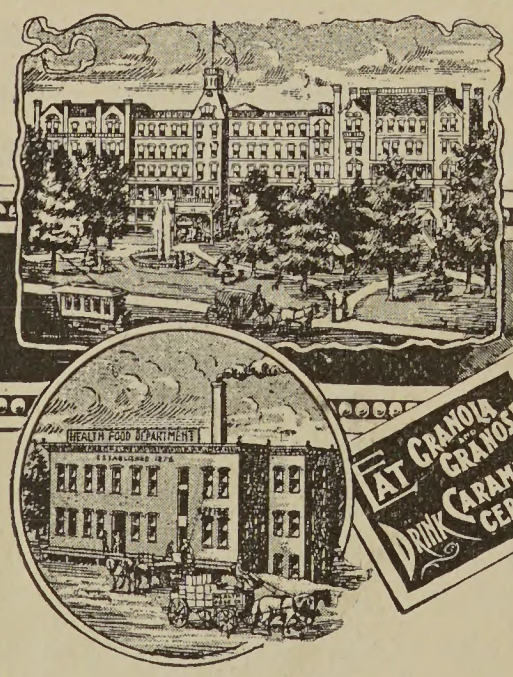

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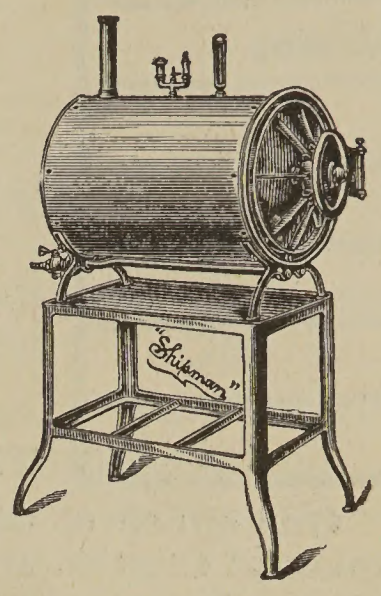

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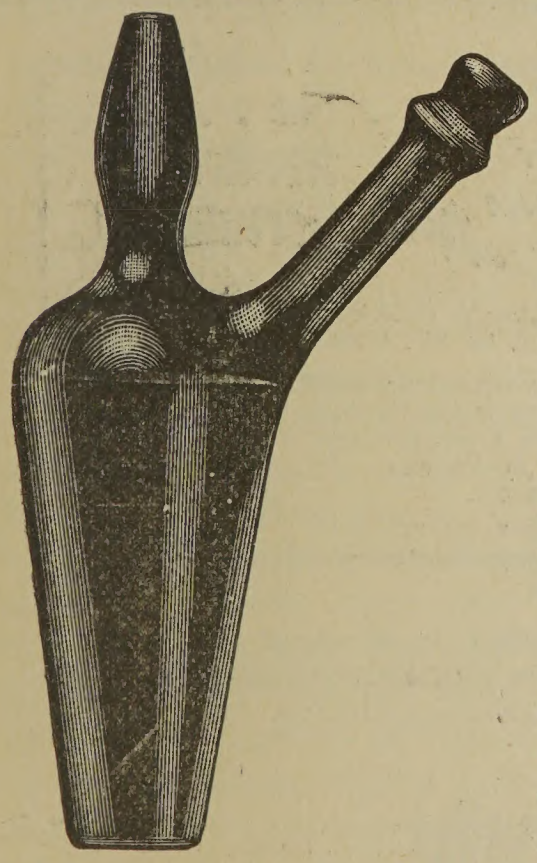

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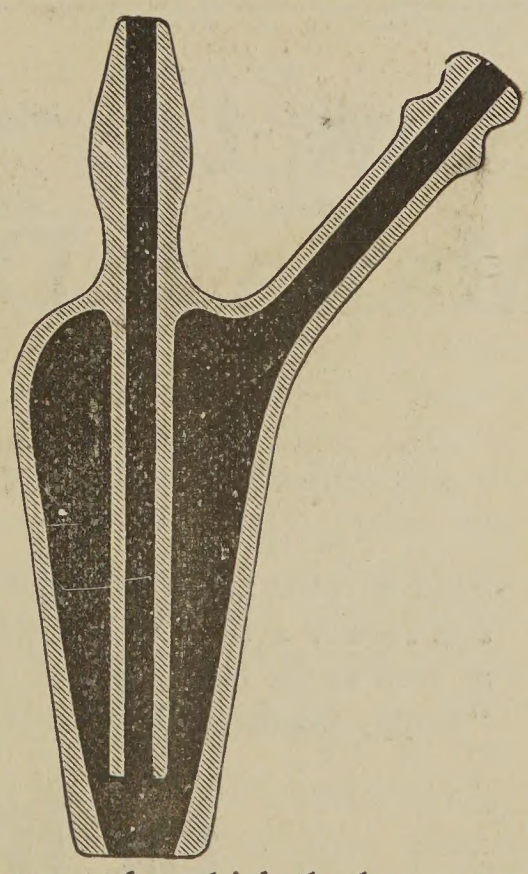

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BACTERIOLOGICAL REVIEW.

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ORIGINAL ARTICLES.

SCOLIOSIS AND ITS TREATMENT BY MEANS OF GYMNASTICS.

BY DR. T. J. HARTELIUS.

Translated by Dr. David Paulson.

(*Continued.*)

THE TREATMENT OF SIMPLE ONE-SIDED SCOLIOSIS.

HERE the fundamental principle is also simple, the indication being to restore the antagonism, or equilibrium, between the muscles of the opposite sides. The muscles upon the convex side are weakened or pathologically changed, and must be restored to a normal condition. They must be exercised, regenerated, and strengthened. If the convexity is upon the left side, as is common, bending is made toward the left, with pressure upon the highest point of the convexity, thus bringing the muscles upon the left side into activity, while those upon the right side are only passively stretched. In this way not only is the spinal column straightened, but in those cases where no special deformity or ankylosis of the vertebral bodies has taken place, the bending may exert so strong an influence upon the spinal column that the highest point of the curvature, for the time being, is changed, the highest point of convexity being transferred to the opposite side. In those cases where deformity and restrained movement of the vertebral bodies exist, the movement still shows that extension is possible. The neck-firm position increases the effect of the movement.

Neck-firm, Left-side-bending, with Support to the Left Side.— One hand of the operator is placed upon the highest point of the convexity, the thumb upon the opposite hip. The bending is repeated gradually and vigorously several times; it may be done by one operator, yet it is of advantage to have two. The same movement may be carried out in the sitting position, or it may be performed with support against some firm apparatus to the side, toward which the bending is done.

Right-side-lying.— The patient lies on his side, with his legs extended upon the apparatus, the convex side upward. Bending is executed, as in the preceding case, toward the convex side. In this, as in the preceding movement, it is exclusively the muscles of the convex side which are active. The hands rest upon the hips, or, in vigorous persons, are placed neck-firm. If any marked difference exists in the position of the shoulder-blades, neck-firm is made with only one hand, that of the side on which the shoulder-blade is the lowest. This point should also be observed in connection with the preceding movement.

These two movements constitute the essential ones in the treatment of single scoliosis, and should be repeated a number of times in a given series. After some practise, these movements become easy, and are taken without any special fatigue. They may be carried out in the home, the spinal column being thereby kept in constant extension. The necessary efforts properly to develop and strengthen the weak parts should be taken in the horizontal position, alternating the movements. When the movements are made with painstaking thoroughness, a surprising effect is produced. This is explained partly by the powerful and definite action these movements have upon single curvature, and partly by the fact that this form of scoliosis generally appears in the milder types; for, if developed to any considerable degree, it is accompanied by a compensation curve, and has then passed on into double curvature.

We are not limited, however, to the above-named movements. Support-stand-

ing, right (left) arm-upward-stretching is an excellent movement, which can be taken as well as those already mentioned when the shoulders are affected by the curvature. Dissimilarity between the hips also occurs, in which case an active upward raising of the lower hip can be made: stretch-lying, left (right) hip-upward-jerking.

PRESCRIPTION I.

1. Stoop-support-standing, arms-extending-upward with support to the left side.
2. Rest-standing, bending to the left side with support to the same side.
3. Hanging, neck-bending.
4. Right-side-lying, holding.
5. Rest-standing, raising on toes with support to the left side.
6. See No. 2.
7. Hanging, legs-parting with support to the left side.
8. See No. 4.
9. See No. 2.
10. See No. 4.

After each movement, give standing, arms-extending.

If the right shoulder, which is shorter in this form of scoliosis, is also lower, then the right hand is simply placed upon it in the rest position, and support is applied to the highest point of the convexity. All movements work together to the end that the back shall be straightened and the stretched muscles developed and strengthened.

PRESCRIPTION II.

1. Stoop-support-standing, right-arm-extending-upward with support to the right side.
2. Right-rest-right-hip-support-standing, bending to the left side with support to the same side.
3. Rest-standing, raising on toes.
4. Right-stretch-right-side-lying, holding.
5. Right-stretch-lying, pressing the left hip upward.
6. Right-rest-standing, bending to the left side with support to the same side.
7. See No. 5.
8. See No. 4.
9. See No. 2.

After each movement give standing, arm-swinging forward and upward.

Scoliotic persons suffer also from other diseases, which must receive their share of attention in treatment.

TREATMENT OF DOUBLE SCOLIOSIS.

When there is double curvature of the spine, we cannot, as in single curvature, merely straighten the spinal column by movements to the right or left; the opposite curves require movements which tend to correct both at the same time. There is effected in extension a straightening of two or more curves at the same time. If more than two curves are present, the two most prominent ones determine the movements.

Movement. — Neck-firm, stoop-stride-sitting, back-raising, with double side support.

The patient places his hands in the rest position, and bends forward in the sitting position. Pressure is made upon the highest point of both convexities, and then the patient rises and straightens the back under stronger resistance of the operator. Preferably, two operators work together, one being behind, the other in front of the patient.

Movement.— Neck-firm, support-standing, back-raising with double side support.

The patient stands with the anterior part of the thighs against some firm apparatus, and bends the trunk forward. Pressure is applied as in the preceding movement, and the patient raises himself and straightens the back under strong resistance of the operators.

These two movements, which in their effects closely resemble each other, are of great importance in double curvatures. In the second and third stages of scoliosis, where not only bending, but also rotation of the vertebræ exists, the movements must seek to correct both the curvature and the rotation. The given movements produce both these effects at the same time; for, through straightening of the curvature, the rotation passes back to its normal position.

Movement. — Support-standing, left (right) arm-upward stretching, etc. There are other movements which might be utilized in the treatment of double curvature, several of which I will mention.

Forward-bending of the trunk is performed with pressure against the anterior part of the thighs with the left or the right arm; that is, the arm on the same side as the lower shoulder should be stretched upward. The simple taking of this primary position straightens the spinal

column, the effect being increased by forward stretching of the arm.

Movement.— Forward-lying, holding, under left (right) arm-upward-stretching. This primary position produces straightening of the back, which by having the arms stretched upward, is even more vigorously effected.

Movement.— Stoop-sitting, left (right) arm-upward-stretching.

This movement acts similarly to the preceding, stretching the spinal column in the uplifting of the lower shoulder-blade. These last three movements, in connection with the first, are suitable to use in those cases where one shoulder-blade hangs noticeably lower than the other.

In double scoliosis, one hip is generally lower than the other.

Movement.— Left (right) arm-stretch-lying.

The arm of the side the shoulder of which is lower is stretched upward.

Movement.— Right (left) hip-upward-jerking.

Hanging, Knee-bending.— The patient grasps the bar with his hands at such a distance from the floor that his feet, in the stretched position, do not reach it; or if his strength is weak, the feet may rest upon the floor, but the hands should then grasp the bar so high up that the arms and back are stretched. The patient bends the neck under resistance of the operator. This movement secures, at the same time, both passive and active stretching of the spinal column.

Prescription III.

1. Stoop-support-standing, left-arm-extending-upward, double pressure.
2. Left-rest-stoop-support-standing, back-raising, double pressure.
3. Hanging, neck-bending, double pressure.
4. Left-rest-stoop-stride-sitting, back-raising, double pressure.
5. Hanging, legs-parting.
6. See No. 4.
7. Left-stretch-right-side-lying, stretch-holding.
8. See No. 2.
9. See No. 4.
10. See No. 7.

After each movement, give standing, arms-extending.

Some of the most efficient movements should be repeated a number of times each day, but the movements described should constitute the general plan of gymnastic treatment. The chief importance in these movements does not attach to their great variety, but to the selection of the right kind and their proper application. The right kind consists in their efficiency to stretch the muscles and develop their strength sufficiently to maintain the spinal column erect. The right application consists in this, that the movements shall be carried out with proper vigor and definiteness, as well as sufficiently often.

Does proper gymnastic treatment, with suitable movements, possess the ability to straighten the spinal column, and develop the power to maintain it in the correct position? It has been already stated that mechanical means are not as capable of sustaining the curved parts of the spinal column in position, as are suitable movements. Any one at all acquainted with gymnastic treatment will not attempt to deny the truth of this. But there is another point which is given as a reason for the use of mechanical apparatus in connection with gymnastic treatment: The continued increased pressure changes the vertebral cartilages and bodies so that they become wedge-shaped, being pointed on the concave side. This change affects first the vertebral ligaments and then the vertebral bodies. This pressure should be removed, so that it will not counteract and hinder the curative action of gymnastics. It may be necessary to wear a suitable supporting apparatus during the day; that is to say, in the erect position, to counteract the weight of the body; and in the night, when in the horizontal position, a support may be needed to counteract the tendency to retraction.

It is probable that the employment of the means above referred to rests upon good grounds. The settlement of this question, whether it shows the employment of mechanical means in scoliosis to be really needed or called for, or not, is, from a practical, and even from a theoretical standpoint, of great importance. When scoliosis is passing through different stages of development, it is of importance to know how to settle the question in each stage.

In those cases where the movement-treatment can fully remove the deformity, it is naturally unnecessary to use these adjuncts; and thus, in all those

cases where the vertebral cartilages and the vertebral bodies have not undergone any essential changes, there can be no room for doubt that the movement-treatment is the right and sure remedy. If the scoliosis is in the second or third stage, with marked deformity in the vertebral cartilages and bodies, then the movement-treatment is just as inefficient as any other means to remove the condition; but a suitable movement-treatment may, more than any other method, produce an improvement in the condition. The improvement consists in this, that the spinal column is stretched as much as possible, in order to develop the strength sufficiently to maintain it in its position. Through this development of the patient's own energies, the concavity is not only diminished, but may even be made practically unnoticeable. The spinal column, although bent, has then become so straightened and settled in position that the parts conform themselves to each other. Experience shows that persons who have had noticeable standing curvature of the spine, have, through movement-treatment, regained so vigorous a condition that they do not experience the least pain or weakness in the back. It would, without doubt, be not only unnecessary but harmful to use any supporting apparatus in these cases. Even though these appliances are ever so delicately constructed for the purpose, they are not altogether harmless. Many cannot bear them. This, however, is an inconvenience which may in many cases be overcome, and which may very often, by habit, not only come to be tolerated, but the persons be apparently benefited. Not a few assert, likewise, that the common corset, which constricts the chest, and is a hindrance to the normal activity of several important organs, is a necessary condition for health. Scoliotic persons who have gained energy to carry the spinal column without feeling pain or weakness, and can perform suitable movements, are not in need of such mechanical means, which may even prove harmful by causing the active muscular powers, which should support the spinal column, to become dependent upon these mechanical supports, and thereby become weakened.

From this it follows that the necessity for external mechanical means is limited to those cases in which, for various reasons, one cannot make use of the movement-cure, or else not with sufficient energy or for an insufficient time. Many circumstances may make the movement-cure impossible; as disease in the bones, or certain diseases in other parts of the body. Financial circumstances may also place insurmountable hindrances in the way of appropriate gymnastic treatment.

(To be continued.)

NON-SURGICAL TREATMENT OF THE PELVIC DISORDERS OF WOMEN.

BY J. H. KELLOGG, M. D.,
Battle Creek, Mich.

(*Concluded.*)

THE following is a brief outline of the method which I pursue in pelvic massage, and which I have described more at length in my work on massage[1]:—

Pelvic massage concerns the following organs:—

1. The uterus.
2. The uterine appendages — ovaries, Fallopian tubes, broad, round, and other ligaments.
3. The vagina, in cases of rectocele and cystocele.
4. The rectum, in cases of prolapsed and relaxed rectum.
5. The prostate in man; sometimes, also, the bladder, in cases in which it is atonic.
6. The coccyx, in cases of coccygodynia, in both sexes.

POSITION.— The patient lies upon the back, with the heels well drawn up, the knees separated, the hip slightly elevated, arms by the side, and the head (not the shoulders) supported by a thin pillow.

PRELIMINARY PROCEDURES. — The manipulations practised in pelvic massage are rendered very much more efficient by the application of a few preliminary movements for the purpose of placing the abdominal and pelvic contents in the most favorable condition possible in any given case. It should be remembered that in pelvic displacements there will always be found, also, displacement of the abdominal contents.

The preliminary movements which I have found the most effective, are: (1)

1 "Art of Massage," by J. H. Kellogg, M. D. Modern Medicine Publishing Co., Battle Creek, Mich.

Deep breathing; (2) Lifting abdominal contents; (3) Inspiratory lifting.

1. Breathing Movements.— The patient is made to execute a few full breaths in which the lower part of the chest and abdomen are well expanded with inspiration, and drawn in as far as possible with expiration.

FIG. 1.—LIFTING VISCERA.

2. Lifting of the Viscera (Fig. 1).— After the patient has taken three or four deep breaths, the physician stands at the patient's left, and with his back to the patient places the ulnar edge of the two hands, with the fingers extended, just over Poupart's ligament and parallel with the ligament, the fingers pointing toward the pubes. From this position the hands are moved slightly upward, the edge of the hands being made to sink as deep into the abdomen as possible without severe pain, the arms being slightly rotated at the same time, and the hands drawn upward in such a way as to grasp the contents of the abdomen and drag them upward. This movement is repeatedly executed during the act of inspiration, the patient continuing to take deep and full breaths, expanding the lower chest and abdomen as previously described. Care should be exercised to see that all displaced viscera are in perfect position.

Essentially the same movement may be executed with the patient in the knee-chest position. The masseur stands with his back to the patient's head, and reaching around the patient with one arm, drags the bowels upward during inspiration.

3. Inspiratory Lifting (Fig. 2).— A number of years ago, while engaged in a series of experimental studies on intra-abdominal pressure, and when one day administering pelvic massage to a patient in whom the uterine supports were greatly relaxed, I observed that with each forcible inhalation the uterus was lifted upward a distance of one-half inch or more. I noticed also that the patient was breathing almost wholly with the upper chest. In order to intensify the effect of the inspiratory lifting, I caused the patient to exhale completely, and then to make the movement of inspiration by lifting the upper chest forcibly while keeping the glottis closed, so that the air could not enter the lungs. The effect of this procedure was very remarkable, the uterus being lifted in an upward direction more than an inch at each inspiratory movement.

FIG. 2.— INSPIRATORY LIFTING OF ABDOMINAL CONTENTS.

Intermittent Compression of the Uterus. — The preliminary movements being completed, one, or, when possible, two fingers (index and middle fingers) of the left hand are introduced into the vagina and crowded upward behind the cervix, the uterus being first placed in perfect position, then lifted upward and forward as far as possible without giving too much pain. The extended fingers of the right hand are at the same time pressed upon the abdominal wall just above the pubes, so as to impinge upon the fundus, covering as large an area of the uterus as possible. Firm, intermittent pressure is then made, continuing for two or three seconds, with intervals of one or two seconds, this being repeated six to twelve times. In this procedure the pressure of the external hand will fall chiefly upon the top of the fundus.

When the vaginal orifice is too small to admit of two fingers, a useful application of massage may be made by the aid of one finger introduced into the vagina and another in the rectum, or even a single finger operating through the rectum.

Digital Kneading of the Uterus.— The fingers of the left hand being returned to the first position behind the cervix, thus supporting the organ, the fingers of the right hand execute a circular digital kneading movement, beginning at the top of the fundus and enlarging the circle until the fingers are made to press down the sides of the uterus and all about it. A slight change in the direction of the pressure made by the fingers of the left hand enables them to antagonize constantly the movements of the right hand, so that the uterus may be by this means very thoroughly manipulated in nearly all cases, except in patients who are very fleshy. This procedure is continued from one to five minutes.

Lifting Movements.—The preceding manipulations will have completely freed the uterus from the overlying intestines, so that the top of the fundus will be lying in immediate contact with the peritoneal surface of the anterior wall of the abdomen. By the combined action of the internal and external hands the uterus can now be freely lifted forward, so that its form may be clearly outlined by the fingers of the right hand. The action should be intermittent.

Vibration of the Uterus. — While supporting the organ with the fingers of the left hand behind the crevix, the thumb or one or more fingers of the right hand is applied to the top of the uterus, and fine vibratory movements are communicated to it. This is a powerful means of stimulating the uterine circulation.

Digital Kneading of the Appendages.— In pelvic massage the manipulation should not be confined to the uterus alone. The ovaries, tubes, and the broad and round ligaments may be masséed thus: After lifting the uterus well forward, freeing it from the overlying intestines, the fingers of the left hand are directed toward an ovary. Starting as low down as possible, firm pressure is made in an upward direction, while the fingers of the external hand are made to co-operate in an effort to grasp beneath the ovary and tube and lift them forward. At the same time, gentle digital kneading movements are executed, the pressure of the external (right) hand being directed toward the fingers placed internally.

Digital Kneading of the Round Ligaments.—The fingers in the vagina should be directed toward the inguinal canal, while digital massage is executed by the fingers of the right hand traveling in a curved line from the external ring along the side of Poupart's ligament and toward the fundus. The internal fingers will, to some extent, follow the movements of the right hand so as to compress the tissues between the fingers of the two hands.

Stretching of Adhesions and Kneading of Exudates.— When adhesions and exudates are present, firm pressure should be made directly upon the bands of adhesion or the masses of exudate with the tips of the fingers which operate internally, counter-pressure being made externally; and, as far as possible, the morbid parts should be grasped between the fingers of the two hands, and thus subjected to digital massage. Adhesions are also stretched by the lifting movements of the uterus previously described.

Nerve Compression.— The sacral plexus of the spinal nerves and several of the lowermost pairs of ganglia of the sympathetic are accessible to digital pressure through the vagina; and in appropriate cases these, as well as other nerve structures, may be stimulated by gentle compression in connection with other

procedures. One of the largest nerve masses accessible to compression through the vagina is the hypogastric plexus, which is located on the anterior surface of the sacrum, just below the promontory. A row of four or five sympathetic ganglia lies on either side of the median line just over the junction of the sacrum and ilium, the anterior aspect of the sacro-iliac synchondrosis. A single ganglion (coccygeal ganglion, or *ganglion impar*) lies in front of the coccyx. Pressure made upon these points stimulates the ganglia and their branches, and by this means excites the circulation in the pelvic vessels.

Massage of the Abdominal Muscles. — After the internal manipulation, the muscles of the lower abdomen and inner thighs should be gently masséed. The procedures most useful are the following, employed in the order named: Tapping, hacking, spatting, centripetal friction, and finally, stroking.

Finishing Movements.—

1. Knees separating, breathing. The patient should inspire while separating the knees, and expire while closing them. The vigor of the exercise may be increased by making a slight resistance to the movements of both adduction and abduction. The movements should be made at the rate of ten or twelve per minute.

2. Hips raising, breathing in as the hips rise, and breathing out as they sink. This movement should be repeated from four to eight times. The movements of knees separating, hips raising, and breathing may be executed simultaneously.

3. The treatment should be concluded by having the patient turn upon the face and administering percussion — tapping, hacking, spatting, beating, and clapping over the sacrum and fleshy portions of the hips.

The following points should be carefully observed in the administration of pelvic massage: —

1. Never administer pelvic massage to erotic patients, nor in cases of vaginismus, acute pyosalpinx, pelvic abscess, growing tumors of the uterus or ovaries, rectal ulcer, acute vaginitis, irritable urethra, or inflammation of Skene's glands, until after these conditions have been removed. The best results are obtained in cases of subinvolution of the uterus, relaxed ligaments, recent exudates, and passive congestions with little sensitiveness. Kesch recommends that uterine massage should be applied especially during menstruation, but does not give what seems to the writer to be valid reasons for the recommendation. My opinion is very positive that massage should be discontinued during this period.

2. Before treatment have the patient thoroughly empty the bladder and bowels, employing an enema, if necessary, or a coloclyster (large enema in right Sims's or in knee-chest position). A hot vaginal douche should also be administered.

3. No movements should be made with the hand used internally except with the ends of the fingers.

4. The force employed should generally be sufficient to produce slight pain.

5. In cases of flexion, the flexion should, if possible, be straightened during the manipulation. In all cases of displacement the uterus must be restored to its proper position.

6. Care must be taken to have the patient breathe deeply and regularly during treatment.

Much more might be said respecting the non-surgical treatment of the diseases of women, and I might give a long list of cases illustrative of the value of the measures outlined; I will only say, however, in conclusion, that I know of no class of ailments in which rational non-surgical measures yield such brilliant results as in the treatment of this class of disorders. A few months' careful treatment and training suffices, in many cases, to restore the patient from a condition of apparent hopeless invalidism to one of robust health and active usefulness.

GOOD-BY TO THE JUICY BIVALVE.

BY CHAS. E. STEWART, M. D.

The issues of the *British Medical Journal* for September 12, 19, and 26, contain the special report of G. E. Cartwright Wood, M. D., B. S., on this subject. The report shows that the work has been done in a thoroughly scientific manner, and the results obtained are what one who is acquainted with the life history of micro-organisms and the habitat of shellfish would naturally expect.

At one time it was thought that there was a special idiosyncrasy on the part of

the individual in cases of poisoning from eating shell-fish, but this theory is no longer tenable, for it is a well-known fact that in many instances where some form of shell-fish have been served at large gatherings, every one who partook of them was poisoned.

It has frequently been stated that the symptoms were due to metal poisoning by copper. "One of the facts which has undoubtedly supported the belief in the copper-poisoning theory has been the frequent association of the place of origin of the mussels with shipping, as in the case of docks and harbors; but this, as we shall presently see, is capable of quite another interpretation. The whole history and symptoms of such cases of mussel poisoning are very similar to those cases of meat poisoning (so-called 'botulism') which have been frequently observed and described in recent years. That this is not a merely superficial resemblance has been shown by the researches of Brieger and Schmidtmann on the Wilhelmshavn epidemic which occurred in 1885." They were able to extract from the suspected mussels a very active poison, which they named mytilotoxin. This poison, the author stated, was the product of a special microbe, and was found by Wolff to be produced chiefly in the liver of the shell-fish.

It has recently been observed by Lustig, of Turin, that mussels found in the stagnant waters of harbors and canals are infected with two microbes, "the one innocuous, the other highly pathogenic." The highly pathogenic microbe, when injected into the intestinal tract of animals, rapidly causes death. "The lesson to be learned from these and numerous similar observations is, as we shall show, that no mollusks should ever be used as articles of diet, which have been obtained from waters subject to contamination, since this alone apparently (without the presence of specific infective disease germs such as those of typhoid fever or cholera) can give rise to most dangerous disturbances of the general health."

The old idea that oysters were free from the danger of producing the poisonous symptoms which had been observed to follow the ingestion of other forms of shell-fish, is no longer held. On the contrary, poisoning produced by the ingestion of oysters is of common occurence, and accounts of such cases are frequently reported. Besides containing a poison which when taken into the system produces severe gastro-intestinal disorders and in many cases death, the oyster may be a means of conveying infectious diseases such as cholera and typhoid fever.

Typhoid Fever Germs.

M. Chantemesse (*La Presse Médicale*) recently reported the results of an investigation made by him in several cases in which the patients had contracted typhoid fever after eating oysters. A bacteriological examination of the oysters revealed the presence of both the colon bacillus and the typhoid bacillus. The author states that "the contamination of oysters occurs in oyster beds at the mouths of rivers; the more heavily the rivers are charged with organic matter, the fatter the oysters become, and the more dangerous."

Within the last few years American physicians have reported a number of similar cases; and the thoroughness with which the work has been done proves quite conclusively that the oyster is another of the means by which pathogenic and other germs find their way into the human organism.

From the experiments that Dr. Wood has carried on, he has shown that the germs of typhoid fever and cholera live for months in sea-water. He found that sea-water inoculated with these germs contained on the first day 100,000 to 120,000 germs in each c.cm.; at the end of three months each c.cm. was found to contain 80,000 to 90,000 germs. Experiments were made with sea-water obtained from a large number of places, but the results obtained were practically the same

in all cases, "showing clearly that large numbers of these persist over as long a period as three months."

It frequently happens that before the consumer obtains his oysters they have been in the shop some days. A bacteriological examination of such oysters reveals the presence of large numbers of germs, these, in the majority of cases producing ptomains which, when injected into animals, produce deadly effects.

The following table shows the result of a bacteriological examination of oyster juice. These oysters were kept in tap water to which some salt had been added. The water was changed daily during the course of the experiment, and the basin was kept in a cool, well-ventilated room.

AVERAGE NUMBER OF COLONIES DEVELOPING FROM ONE CUBIC CENTIMETER (ONE-FOURTH DRAM) OF OYSTER JUICE.

First Day.	*Second Day.*	*Third Day.*
60 to 80	500 to 600	1700
Fourth Day.	*Fifth Day.*	*Sixth Day.*
2000 to 3000	5000	12,000 to 14,000

From this table it will be seen that the longer the oyster is kept out of its natural surroundings, the more dangerous it becomes to the consumer.

The following tables give a brief summary of the facts obtained from the examination of oysters obtained from different sources: —

FIRST-CLASS RESTAURANTS.

Description of Oysters.	Average Number Organisms per dram of Oyster Juice.	Toxicity of Broth Cultures on Animals.
Natives	44,000	toxic
Dutch	560,000	
Natives	300,000	toxic
Best Seconds	140,000	toxic
Dutch	720,000	toxic
Best Seconds	880,000	toxic

OYSTER SHOPS.

Whitstable Natives	7,200	toxic
Scotch Natives	240,000	toxic
Anglo-Dutch	180,000	
French-relaid	120,000	
Scotch Natives	280,000	toxic
Anglo-Portuguese	64,000	toxic

Examinations of oysters from various other sources were made with practically the same results as shown in the preceding tables.

"The results of the examination of oysters from various sources, as they are supplied to the public for immediate consumption, show that the mollusks at that time frequently contain almost stupendous numbers of bacteria."

"From the experiments recorded in this report it must be accepted that the

CHOLERA GERMS.

disease germs (cholera and typhoid fever bacilli) with which we have here to deal, can probably exist in sea-water for at least two months, and that these would possibly, or even probably, still remain more or less virulent and infective in their character. The laboratory experiments carried out with infected oysters have shown that the cholera germs do not disappear as rapidly as stated by Giaxa, and we have every reason to believe from comparative experiments that other pathogenic microbes would persist in a similar fashion."

The results of Dr. Wood's experiments show clearly that the oyster is a dangerous article of diet, and a study of its structure and its natural surroundings substantiates this conclusion. It thrives best in sewage-polluted water, its food consisting chiefly of the organic matter and débris found in the water.

The oyster is a complex organism, and possesses two labial palps which overhang the mouth, an intestinal tract, and liver, kidneys, gills, heart, and nervous ganglia. Professor Huxley says of it, that "when the sapid and slippery morsel, which is and is gone like a flash of gustatory summer lightning, glides along the palate, few people imagine that they are swallowing a piece of machinery (and going machinery, too) greatly more complicated than a watch."

TRANSLATIONS AND ABSTRACTS

[THE articles in this department are prepared expressly for this journal.]

MEAT POISONING.

A CURIOUS case of poisoning has recently been reported from Sheffield. A Mr. Stead and his family ate heartily of brawn, and shortly after all became ill with violent abdominal pains, accompanied with much vomiting. Within a short time all the younger members of the family fully recovered, but the father developed symptoms of local blood poisoning, and his leg had to be amputated above the knee.

It is impossible, or at any rate difficult, to discuss a case on the meager facts supplied by a lay journal, because we cannot be certain of the sequence and consequence of events. If, however, the data are correct, the case is an interesting one, and serves to recall a fact which, perhaps on account of its rarity, is not sufficiently kept in mind. It is that septicemia, taking this term in its pathological sense — that is, hemic infection — may occur without any external wound, as apparently it did in this instance, from the alimentary tract.

It seems that in this case organisms found access to the bone marrow, whither they must have passed from the intestinal tract. It is now generally acknowledged that the bone marrow forms a good resting-place for micro-organisms. Thus the typhoid bacillus can frequently be recovered from the bone marrow after death, and on inoculating animals intravenously with typhoid bacilli, the latter may be found two to three weeks later in the marrow and spleen, when the heart's blood is already free from them. In the case of typhoid fever and other infections, pyogenic micro-organisms frequently find their way to the bone marrow, producing an osteomyelitis. It may be said that in the case of typhoid fever the intestines are ulcerated, and that thus a ready entrance into the circulation is offered to the bacteria.

This explanation does not, however, suffice in the case of other infective fevers, such as measles, scarlet fever, etc., where osteomyelitis is not unknown. We must allow that micro-organisms may find their way into the circulation, into the bone marrow, subcutaneous tissue, serous membranes, etc., without there being an obvious breach of surface or obvious communication with the circulation. Klein further has shown that a septicemia may be produced in animals by unsound food, or by feeding them with pure cultures of certain bacteria, which, on subcutaneous injection, have no effect on them.

This, then, is the important lesson: that food poisoning may lead to an infection, either a local one of the alimentary tract, a gastro-enteritis, or a general one, a true septicemia; and that just as in the case of typhoid enteritis, distal suppurative lesions may appear, either in the bones or subcutaneous tissues, so also it is not impossible that in an enteritis produced by other infective agents similar lesions may appear.

The etiology of infective endocarditis is often obscure, and its possible intestinal origin in some cases is perhaps never thought of. In typhoid fever, ulcerative colitis and dysentery and infective endocarditis occasionally form a fatal complication; and in the case of typhoid fever either pyogenic organisms or Eberth's bacilli are found in the heart, generally the former.

These considerations should lead us to extend our field of clinical observation, and to remember that if the outer surface of the body is but a slender barrier against hemic infection, the inflamed mucous membranes of the stomach and intestines certainly require as much attention. Obscure cases of pyemia, septicemia, or infective endocarditis may, in some cases at least, have their bacterial source in the diseased surface of the gastro-enteric tract. — *British Medical Journal, June 13, 1896.*

New Mode of Disinfection and Sterilization. — The Antwerp correspondent of the Liverpool *Journal of Commerce* says: —

"In all large ports the medical commission plays a very important and responsible part, and its duties have been all the more arduous during the last four years, since the United States has demanded such rigid examination of all

emigrants, their baggage, etc. In connection with sanitary arrangements and regulations of the port, some experiments of a most interesting character were made at the St. Pierre Hospital in the presence of the Antwerp Medical Commission. The subject of the experiments was the demonstration of a new and practical mode of disinfection and sterilization. The means employed consist of a gas obtained by the partial combustion of methylated spirits, which, while perfectly innocent in its effect upon human beings, being non-toxic and free from all corrosive action, is said to possess the property of destroying every trace of bacteria or microbes in the atmosphere of any inclosure. The experiments so far have been thoroughly successful.

"If such a system of disinfection can be proved efficacious, it will be a blessing to steamship companies plying between Europe and the United States; for in time of contagion of any kind the United States government demands fumigation by sulphur, which is a most disagreeable and unprofitable process. The question will be studied with a view to adapting it to the disinfection of ships, passengers, luggage, and cargo."

Straightening the Spine by Wiring the Spinous Processes Together. — Chipault's new method (*Journal Am. Med. Asso.*) of treating caries of the spine is described in the *Therap. Woch.*, No. 35. The spine is straightened and held in this position by wires that fasten the spinous processes together, so that the orthopedic appliances do not have to contend with the constant tendency to curvature. After chloroform, the patient is placed on his stomach, three-quarters pronation, the back turned to the operator. A longitudinal opening is then made along the spinous processes, two to three vetebræ above and below the limits of the curvature. Without touching the interspinous ligaments, both sides of the processes are exposed, and the soft parts drawn aside; the assistant at each end then pulls the spine to straighten it as much as possible, and a silver wire is passed through the interspinous ligament above the highest process to be ligated at the bottom near the root. The wire is then cut, leaving on each side a piece twice as long as the wound. The ligating is done with these two ends, crossing them back and forth and passing them through each interspinous ligament from the highest process downward until the lowest is reached, when the two crossed ends are twisted together. The wires must be passed through the ligaments close to the lower edge of the process above to afford as firm a support as possible. Each crossing must be tested to see if it is strong and taut before proceeding to the next. The soft parts are then sutured without drainage, bandaged, and the patient is placed in bed. The two difficulties, lateral curvature of the spine and anchylosis of adjoining processes, are met by boring a hole in the processes in the latter case, and in the former by extending the end of the wire on the convex side up to the loop at the top and stretching it tight, which also straightens the lateral curve. In cases of lumbar or dorsal caries, the bandage can be changed in five to six days, and in cervical caries in ten, and the stitches removed from the soft parts.

This ligature of the spinous processes is undoubtedly an advance in the treatment of Pott's disease, but it applies only to moderate curvatures of recent origin, that have commenced suddenly and developed rapidly and are capable of reduction in anesthesis, and to weak spines. It is not adapted to old curvatures or those involving too many of the vertebræ. The presence of an unopened cold abscess or of paralysis is no obstacle. Absolute immobilization should follow the operation.

Sextuplets.—A case is recorded by Vassali, in the *British Gynecological Journal*, 1895, of a case of sextuplets, in which the woman, who was a native of Italy, gave birth to six children, four of whom were males, and two females. There was but a single placenta.

Massage in the French Army.— The French Minister of War has decreed that hospital orderlies shall in future be taught the art of massage. Classes for this purpose will be instituted in Paris (Val-de-Grace Hôpital), at Lyons (Hôpital Desgenettes), and at Algiers (Hôpital du Dey). After a six weeks' course the pupils will be distributed among the principal military hospitals.

The Treatment of Atony of the Small Intestine in Neurasthenics.— Dr. Chalmet, believing that whether the nervous system presiding over the epithelial (secretion and absorption) and muscular functions may or may not play the principal part in this condition, the best method of improving the tone of the nerve is to nourish it better. To improve nutrition he administers during the early hours of intestinal digestion a salt-water enema of a concentration above that of blood serum — *e. g.*, 0.1 to 1.2 per cent. of salt — in order that he may produce in the large intestine an osmotic current which shall act at a distance upon the small intestine, retarding absorption and permitting the transformation of food-stuffs to go on for a longer period before absorption of the liquid containing these substances in solution.— *Journal des Praticiens, 1896, No. 18, p. 276.*

Effects of Flesh-Eating on Teeth.— In the present flesh-eating age of Great Britain, perhaps no complaint is more general than caries of the teeth; and as animal food is a frequent cause of indigestion, it thus conduces to the decay of those useful portions of the human fabric. But there is a more direct mode by which animal food produces this effect. Bell, Fox, and other writers attribute the decay of the teeth to inflammation situated either in the lining membrane or the bone proper of the teeth; but Dr. Robinson proves — by a number of considerations drawn from the structure, physiology, and development of the teeth, and from operations performed on them — that caries is the chemical result of decomposed food upon the teeth, and not the result of inflammatory action.

Upon examination it will be found that there are fissures formed in the enamel of the teeth, in consequence of the irregular distribution of that substance upon the surface; also, that there are interstices, produced by the crowded position of the teeth and irregularity of their shape; and, as the fibers of animal food retained between the teeth undergo a process of decomposition by the action of oxygen they acquire the property of corroding, disuniting, and thereby destroying the earthy and animal substances of which the teeth are composed. At first there is formed but a very small hole, which is increased by the daily action of the same causes; the phosphate of lime is gradually disintegrated by the carbonic acid, aided by the secretions of the mouth, until at length the nerve becomes exposed, and toothache is the result. Vegetable food is not so liable to be detained between the teeth; and when this does occur, it is not so injurious, because the starch of which such food principally consists is much more easily acted on by the saliva, and converted into gum or sugar — one of the nutrient principles. The popular notion that sugar injures the teeth is incorrect, except in cases where, by its admixture with other substances, it causes indigestion. "It has been alleged," says Dr. Wright, "that the eating of sugar spoils the color of and corrupts the teeth. This, however, proves to be a mistake; for no people on the earth have finer teeth than the negroes of Jamaica."— *Fruits and Farinacea.*

Potassium Permanganate in the Treatment of Opium-Poisoning.— Dr. Arthur P. Luff believes that his experiments demonstrate the selective faculty of this drug for morphine in the stomach contents, and confirms Moor's conclusion as to its value as an antidote. When the quantity is known, the antidote should be given slightly in excess of the morphine. If laudanum in known quantity has been taken, six grains should be given for each fluid ounce of poison. If the amount of morphine or opium is unknown, eight to ten grains should be administered, according to the severity of the symptoms, dissolved in from four to eight ounces of water. The stomach should be washed out at half-hour intervals with a weak solution of the antidote. In cases of poisoning by the hypodermatic injection of morphine the hypodermatic injection of the antidote would not be likely to be of use. In cases of threatened respiratory failure, strychnin, preferably, or atropin should be given hypodermatically, and, if necessary, artificial respiration be resorted to.

Mr. F. P. Maynard states that this is a strictly local antidote, acting only upon such opium as it comes in contact with in the stomach, and can have no effect upon such as has already been absorbed. The treatment, however, is excellent, as leading to a thorough washing out of the

stomach, and at the same time affording a reliable indication when this has been accomplished. It is not to be expected that it will save life when a lethal quantity has already been absorbed into the circulation, nor can it be regarded as a physiological antidote, as is eserin to atropin. — *British Medical Journal, 1896, No. 1846, p. 1193.*

Statistics of the Treatment of Diphtheria with Antitoxin.— Loddo (*Rif. Med.*, July 11, 1896) has put together the various official statistics on this treatment in Europe, America, Australia, and Japan. They include about 10,000 cases treated in eighty-six hospitals, with a mean mortality of 18 per cent. Fifty-three of these hospitals furnish comparative statistics of treatment with and without serum; 7277 cases were treated with serum, giving a mean mortality of 20 per cent. as against a previous mortality of 44.3 per cent. In addition to the above 10,000 cases, Guérard has collected the accounts of 3760 cases treated with serum in private practise; here the mortality was only 7.8 per cent. Adding these to the others, there was a mortality of fifteen per cent. on the 13,760 cases. The author then cites a series of figures which tend to show that serum-therapy is of little value, and may even be harmful. Of these latter, about 3000 cases are collected, giving an average mortality of nearly 23.4 per cent.

Influence of Hot and Cold Baths on the Chemical Changes of the Blood and Urine. — Strasser (*La Semaine Medicale*) finds in his experiments with hot and cold baths, that when the cold bath is used, the amount of alkali in the blood is increased, and the acidity of the urine diminished. Hot baths, on the other hand, seem to increase the amount of acid in the urine, while the amount of alkali in the blood is diminished. As both hot and cold baths increase the amount of chemical changes, the author explains the results which he obtained as follows; viz., that hot baths produce rather an organic dissociation than an oxidation, while cold baths produce the opposite effect. Capper has shown that the urine, which becomes alkaline with a vegetable diet, will become acid under the influence of the cold bath. Strasser ascribes the alkalinity of the urine to the excess of alkaline carbonates; and as cold baths increase the elimination of carboinc acid through the lungs and the skin, the urine thus ceases to be alkaline.

Action of the Stomach During Sleep.— Examinations of the contents of the stomach obtained in sleep have convinced Schule (*Berlin Klin. Woch.*) that the acidity of the stomach is greater during sleep, and that its motility is lessened at that period. Persons with digestive trouble, therefore, especially if hyperacidity is present, ought not to sleep after eating. Instead, the meal should be followed by wakeful repose.

Two Cases of Heart Disease Treated by Saline Baths.— Dr. G. V. Poore, in describing this treatment, (*British Medical Journal*, 1896, No. 1845) states that the baths used contained four pounds of sodium chlorid and six ounces of calcium chlorid to forty gallons of water. The temperature of the bath was 95° F., and the time of immersion was limited to eight minutes. The first of the cases treated in this way was one of aortic obstruction and insufficiency, in which the murmurs were exceptionally loud. After the bath the area of cardiac dulness was diminished, and the transverse and vertical measurements proportionately decreased; the character of the murmurs was unchanged. The second case was one of aortic obstruction and insufficiency. After each of the four baths the area of cardiac dulness diminished both vertically and transversely.

Poisoning by Stale Eggs.— Cameron (*Dublin Medical Journal*, October, 1895, p. 311) has reported the occurrence of vomiting and purging in seventy-four nuns and girl pupils in the boarding-school attached to a convent in Limerick, following a dinner at which mutton and a custard composed of eggs, milk, corn-flour, and sugar, were eaten. The corn-flour was suspected of containing arsenic, but analysis showed it to be free from poison of any kind, and to be of good quality. The sugar also proved

to be pure. No other constituents of the meal could be obtained. The vomit and the stools were intensely green from the presence of biliary matter, but careful analysis failed to disclose the presence of ordinary poison. The viscera of two patients that had succumbed were also examined, but no poison was found. Ptomains were found present, but in small quantity. The milk used had been boiled, and the meat was above suspicion. The eggs, however, were not fresh, and one presented a reddish-brown color, and was thought to be bad. Some of the custard was given to the pigs, and induced severe diarrhea.

Treatment of Diabetes.— At the recent French Congress of Internal Medicine (*Sem. Méd.*, August 19) Moussé, of Toulouse, said he had tried antipyrin with the object of diminishing the amount of sugar, uric acid, and urea, but that the diminution had only been fleeting. The author therefore concludes that antipyrin should not be prescribed for diabetes. He has also tried beer yeast and fresh pancreas, but with no better results. In his opinion the corner-stone of treatment in diabetes is diet; if drugs are used, their effect should be closely watched, as they are not infequently hurtful.

Fatal Poisoning by Oysters.— Dr. Anton Brosch (*Wiener Klin. Woch.*, 1896, No. 13, S. 219) reports a very carefully observed instance. The following pathological conditions were present: Hemorrhages the size of a pin-head in the cerebellum, edema of the spinal pia, and hemorrhages in the gray matter, especially in the dorsal and lumbar regions, also in the pleura and lower portion of the ileum. The cardiac portion of the stomach was ecchymosed, and the spleen enlarged. The microscope showed the presence of an advanced parenchymatous degeneration of the muscular fibers of the heart and of the renal epithelium. The protoplasm of the liver cells was filled with large and small fat-balls. The cell-wall and the nuclei were not changed. The hemorrhages were probably due to the manner of the death, and not to the poison itself. Although the chemical examinations are unsatisfactory, the clinical picture is distinct, and should not be mistaken.

These cases should be separated into two classes, the bacterial cholerines and the severe poisonings. In the first, evacuants and disinfectants should be given; in the latter, the stomach should be cleansed by the pump and the intestine by high irrigation; frequent evacuations of the bladder by catheterization should be induced, and artificial alimentation by the stomach-catheter, and artificial respiration resorted to if necessary.

Galvanic Current in the Treatment of Lead Colic.— Drs. Labadie, Lagrave, and Regnier report (*Charlotte* [N. C.] *Medical Journal*) the successful treatment of four severe cases of lead colic by means of the galvanic current. In each case the pain was at once relieved, and recovery quickly followed. The method of application is as follows: —

A large zinc plate electrode is placed over the abdomen, and a rectal electrode passed into the anus; this is connected with a syringe, so that a stream of water can be kept constantly flowing around the rectal electrode to prevent injury to the bowel. The abdominal electrode is first connected with the negative pole, and a gradually increasing current passed through until twenty to forty milliamperes is reached. It is then reduced to zero, and the current reversed, when the same process is repeated. This time the current is interrupted at intervals at such a strength that it produces a contraction of the abdominal muscles. The current is then gradually reduced to zero, and the "galvanic injection" is complete. This method of procedure generally produces a complete evacuation of the bowels.

In cases in which it is only necessary to stop the pain, the following method may be employed: Place the positive pole over the three lower dorsal vertebræ, and the negative pole over the pit of the stomach, using five to ten milliamperes of current.

The Operative Treatment of Jacksonian and Focal Epilepsy.— C. B. Nancrede (*Annals of Surgery*, August, 1896) reports some cases of Jacksonian and focal epilepsy which he has operated upon. The course pursued by other cases of epilepsy upon which he has operated

confirm the conclusions to which he has reluctantly been forced; viz., that —

1. Removal of the discharging lesion in cortical and Jacksonian epilepsy can only be regarded as palliative, the operative scar, in all instances thus far accessible to him, in time becoming a new source of irritation.

2. The earlier the operation is done after the disease becomes fully established, the longer will the immunity last; and it is possible that if trephining be done very early, the operation may in a few instances prove curative, especially if any reliable method can be devised to lessen the extent of the inevitable scar and adhesions between the brain and the membranes.

3. The operation is not so dangerous in competent hands as to forbid our urging trephining in this class of epilepsies, especially when done early, because the chance of prolonged immunity is great, and the fits are apt to become lighter, and to recur at greater intervals after relapse than before trephining.

4. Removal of the discharging lesion is imperatively demanded as a life-saving measure in those rare cases where the intervals between the fits are so short that the paroxysms are practically continuous.

5. In all cases, but especially those characterized by frequent paroxysms, it is an error in practise to permit the early resumption of work by the patient, particularly manual labor.

Tight Lacing. — Dr. F. Schuman Leclercq (*Virginia Medical Semi-Monthly*, May 22, 1896) says that, according to Naunyn, constricted liver from lacing is found in from 20 to 20.5 per cent. of the cases examined, but Schroeder states this malformation to be present in 59.5 per cent. When we stop to consider that even moderate lacing impedes considerably the flow of bile without necessarily giving origin to an anatomical groove of constriction, we can claim even a higher percentage of gall-stone disease as being called forth by lacing. However, even the tying of skirts around the abdomen will in due time at least relax the abdominal muscles and interfere with the abdominal pressure, or bring forth other active etiological agents, such as tractions on the gall ducts, on the ligaments, interference with the physiological gall-bladder contractions, causing floating kidney, etc. Any corset and any tight fastening of skirts around the waist must needs in time dislocate at least the liver, the stomach, or the colon to a more vertical position, and tractions between these organs will ultimately loosen the protective, complicated, ligamental apparatus of nature. We cannot, therefore, sufficiently praise the honest and noble efforts of the reform corset movement, with skirt suspension from the shoulders. — *Medical Record.*

Application of Gastric Juice in Therapeutics. — At a recent meeting of the Académie de Médicine, Fremont announced that he had obtained very satisfactory results in relieving and curing gastric disturbances such as enteritis, grippe with gastro-intestinal complications, apepsia, etc., by administering gastric juice obtained by isolating the stomach of dogs.

A Strange Remedy. — The *British Medical Journal* reports the curious fact that cow dung is still used in some parts of England as a poultice in case of abscess of the breast.

The Konig-Maas Method of Restoring Persons Apparently Dead from Chloroform. — (*St. Louis Med. Era.*) Standing on the left side of the patient and facing him, place the ball of the thumb of the right hand at a point on the patient's chest between the apex-beat and the sternum. Repeatedly press in the thoracic wall with a quick, strong movement, at the rate of thirty to one hundred and twenty times to the minute.

Treatment of Ozena with Diphtheria Antitoxin. — The *Medical Week* for May 1 contained a report by Drs. Bellfanti and Vedova, of the treatment of thirty-two cases of ozena by the injection of diphtheria antitoxin. Ten c.c. were injected daily or every other day. On an average, thirty c.c. were required to effect a cure, — which occurred in a majority of cases. The first effects were congestion of the nasal mucous membrane, which was soon followed by a disappearance of the fetid odor, and cessation of the formation of crusts. No unpleasant symptoms were produced.

BACTERIOLOGICAL NOTES.

[THE notes appearing in this department are abstracts or translations prepared expressly for MODERN MEDICINE AND BACTERIOLOGICAL REVIEW, from original sources.]

Bacteria in the Urine in Non-bacterial Febrile Disease.— Chvostek and Egger (*Wiener Klin. Woch.*, 1896, No. 30) report the occurrence of bacteria in the urine in paroxysms of malaria and in fever produced by injections of tuberculin. As the experiments were conducted in such a way as to exclude the usual causes of error in such observations, the authors believe that fever serves in some way to favor the excretion of micro-organisms, though no bacterial disease in the usual sense exists. They suggest that this may be simply the exaggeration of a process which must occur at times in healthy persons. Bacteria gain entrance to the blood in various ways, perhaps most frequently by way of the lymphatics, and are finally excreted with the urine. These germs are probably more or less lowered in vitality, so that they cannot often be cultivated successfully; but in fevers such as the authors worked with, the excretion is more rapid. These and other observations show that the presence of non-specific bacteria, especially the staphylococcus albus, in the urine cannot be looked upon as of great importance, and that other facts must be brought forward in order to prove their relation to the disease.

A New Culture Medium for the Diphtheria Bacillus.— Joos (*Jour. Méd. de Bruxelles*, May 7, 1896) has had occasion to make a large number of bacteriological examinations in cases of suspected diphtheria. He finds that the ordinary methods of cultivating Löffler's bacillus are not satisfactory ; he also finds Deycke's method unsatisfactory, as it hinders the growth of the Löffler bacillus, and stunts the colonies. Joos has modified Deycke's medium, and claims to have found a material on which no other bacillus except that of diphtheria will grow normally. He prepares "albuminate of soda" by adding saturated caustic soda solution to serum of strong alkalinity, placing the mixture in a vapor bath for half an hour, and filtering. To the filtrate is added pure hydrochloric acid till the reaction is neutral or very slightly alkaline. If too much caustic soda was not added at first, the substance is now ready for use ; otherwise the excess of sodium chlorid requires to be dialyzed out. On evaporating to dryness, a powder is obtained which is readily soluble in water, and which is not coagulated by heat. The nutritive medium is prepared by adding to 1000 gr. of peptonized bouillon 20 gr. each of agar and "albuminate of soda." The mixture is placed in the autoclave at a temperature of 115° to 120° C. for half an hour ; then 15 c.cm. of caustic soda are added, and the whole put back in the autoclave for fifteen minutes, after which it is filtered in the vapor bath. After filtration it is sterilized at 120° C. in the autoclave for three quarters of an hour, when it is ready for the preparation of the plates. It is claimed by Joos that streptococci will not grow on this medium at all, and staphylococci but feebly, while Löffler's bacillus grows luxuriantly in from six to twelve hours. If the presence of streptococci is to be determined as well, the amount of "albuminate" is to be reduced to one and one-half per cent. At the end of fifteen to eighteen hours small colonies of streptococci may be seen among the large and well-developed patches produced by the diphtheria bacillus.

Meningitis in Enteric Fever.— Kuhman (*Berlin Klin. Woch.*) observes that the disproportion between the cerebral symptoms in typhoid fever and the morbid lesions found in the nervous system have long attracted attention, and that these pseudo-meningeal symptoms are well known to experienced observers. Purulent meningitis has occasionally been seen in enteric fever. It has been put down as a mixed infection due to pyogenic micro-organisms, but it has been shown that the typhoid bacillus has pyogenic properties, and can produce this purulent meningitis. The author relates a severe case of enteric fever in a man aged thirty-two, accompanied by hemorrhage, and complicated by purulent meningitis. A bacteriological examination of the blood during life showed colonies of the typhoid bacillus. The cerebral symptoms did not appear until the thirty-second or thirty-third day of

the disease. The patient rapidly became somnolent, the pulse irregular, and the urine and feces were passed unconsciously. The pupils were equal, but reacted sluggishly. There was slight retraction of the head, but no optic neuritis. Death occurred on the thirty-sixth day, in profound coma. The typhoid ulcers were nearly all in process of healing. Numerous typhoid bacilli were still present in Peyer's patches. There were slight microscopic changes in the renal epithelium. After the removal of the dura mater, the convolutions were seen to be covered with purulent exudation. The pus was intimately connected with the pia mater. A bacteriological examination showed the presence of the typhoid bacillus in the mesenteric glands, spleen, and exudations.

Leucocytes and the Bactericidal Action of the Blood.— Hahn (*Arch. f. Hyg.*, vol. xxv, p. 105) has investigated the action of blood serum and also the pleural exudation of rabbits. The leucocytes in the latter are destroyed by freezing. He found that the exudate had a more powerful bactericidal action upon staphylococcus pyogenes aureus and bacillus typhosis than the blood serum or the defribinated blood of the same animal; and since the leucocytes were destroyed, the action cannot depend upon phagocytosis in Metchnikoff's sense of the term. The author made experiments with Lichenfeld's histin-blood, in which the leucocytes remained unaffected, in order to determine whether the bactericidal power depends upon the destruction of leucocytes or upon substances secreted by the leucocytes while still alive. He came to the conclusion that the latter is the more probable explanation.

Presence of the Typhoid Bacillus Outside of Typhoid Patients.— A number of experiments have been made by Remheifer and Schneider (*Am. Journal of the Medical Sciences*, October, 1896) with water, soil, and fecal material from non-typhoid subjects, for the purpose of ascertaining if the typhoid bacillus could be isolated from them. Elsner's medium was used. It was found that in thirty-six specimens of water examined, eight of them contained bacilli which, morphologically and culturally, resembled the typhoid bacillus. Besides these characteristics they all presented the property which has been spoken of as "glabrification;" that is, an animal which, under usual circumstances, would succumb to their inoculation, could be protected against them by typhoid antitoxin.

Cultures made from specimens of earth showed the same bacillus in six. Finally a bacillus identical with Eberth's was found in the stools of three individuals suffering respectively from leucemia, malaria, and Bright's disease, but who had never had typhoid. In five other cases a negative result was obtained. Of the eighteen organisms obtained from these different sources, twelve were pathogenic for animals, and the animal could be protected against a fatal issue by the use of antityphoid serum.

The authors think that these researches throw some light on the general etiology of typhoid, and point to the possibility of autoinfection.

Infection by Pets.— Cats have been suspected of conveying the infection of diphtheria, and scarlet fever has been traced to them. To this may be added (*Chicago Medical Record*) the unwelcome news that a health officer has reported a case of smallpox brought about in the the same way; that is, by a cat from an infected house carrying the disease to a neighboring house.

Another case is reported in *La Médecine Moderne*, "of a seamstress who was in the habit of allowing her dog to lick her face. She was attacked one day with a severe inflammation of the right eye. Oculists were consulted, but their treatment was unsuccessful; and owing to the fact that inflammation of the left eye was beginning, the right eye was cut out. In it was found a tapeworm, which the dog had probably picked up while licking some less pleasing object than his mistress's face.

"The danger of the transmission of parasites by dogs, who are well known to be indiscriminate in choosing objects for the exercise of their tongues, to the hands and faces of their masters, would seem to be a great one. It is remarkable that accidents of the kind related happen as rarely as they do."

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INCREASE OF THE CONSUMPTION OF HORSE-FLESH.

THE first shop for the sale of horse-flesh was established in Paris in 1866; at the present time there are two hundred such shops. In 1872, five thousand horses were eaten in Paris; in 1895, more than thirty thousand.

But the consumption of horse-flesh is not confined to Paris. There are at least two extensive establishments in this country devoted exclusively to the business of canning horse-flesh. There seems to be no physiological objection to the use of horse-flesh as meat. A Frenchman who had frequently eaten it told the writer, some years ago, that the only objection the French people have to its use is that it is too sweet. This sweetness is due to the well-known fact that the flesh of the horse contains a much larger proportion of muscle-sugar than does the flesh of other animals.

The extensive consumption of the flesh of animals by civilized nations is one of the paradoxes of which civilized society presents not a few. Socrates, whose philosophy has had so mighty an influence in the establishment of the foundations of civilization, is represented by Plato in his "Republic" as teaching abstinence from the flesh of animals as one of the conditions essential to the highest good of a civilized community. A conversation is related purporting to have taken place between Socrates and Glaukon upon this subject. It runs thus: —

"'They [the artisans and working people generally] will live, I suppose, on barley and wheat, baking cakes of meal, and kneading loaves of the flour; and spreading these excellent cakes and loaves upon mats of straw or on clean leaves, and themselves reclining on rude beds of yew or myrtle boughs, they will make merry, themselves and their children, drinking their wine, weaving garlands, and singing the praises of the gods, enjoying one another's society, and not begetting children beyond their means, through a prudent fear of poverty or war.'

"Glaukon here interrupted me, remarking, 'Apparently you describe your men as feasting, without anything to relish their bread.'

"'True,' I said, 'I had forgotten. Of course they will have something to relish their food. Salt, no doubt, and olives, and cheese, together with the country fare of boiled onions and cabbage. We shall also set before them a dessert, I imagine, of figs, peas, and beans; they may roast myrtle-berries and beechnuts at the fire, taking wine with their fruit in moderation. And thus, passing their days in tranquillity and sound health, they will, in all probability, live to an advanced age, and dying, bequeath to their children a life in which their own will be reproduced.'

"Upon this, Glaukon exclaimed, 'Why, Socrates, if you were founding a community of swine, this is just the style in which you would feed them up!'

"'How, then,' said I, 'would you have them live, Glaukon?'

"'In a civilized manner,' he replied. 'They ought to recline on couches, I should think, if they are not to have a hard life of it, and dine off tables, and have the usual dishes and desserts of a modern dinner.'

"'Very good; I understand. Apparently we are considering the growth, not

of a city merely, but of a *luxurious* city. I dare say it is not a bad plan, for by this extension of our inquiry we shall perhaps discover how it is that justice and injustice take root in cities. Now, it appears to me that the city which we have described is the *genuine* and, so to speak-*healthy* city. But if you wish us also to, contemplate a city that is suffering from inflammation, there is nothing to hinder us. Some people will not be satisfied, it seems, with the fare or the mode of life which we have described, but must have, in addition, couches and tables and every other article of furniture, as well as viands. . . . Swineherds, again, are among the additions we shall require — a class of persons not to be found, because not wanted, in our former city, but needed among the rest in this. We shall also need great quantities of all kinds of cattle for those who may wish to eat them, shall we not?'

"'Of course we shall.'

"'Then shall we not experience the need of medical men also to a much greater extent under this than under the former régime?'

"'Yes, indeed.'

"'The country, too, I presume, which was formerly adequate to the support of its then inhabitants, will be now too small, and adequate no longer. Shall we not say so?'

"'Certainly.'

"'Then must we not cut ourselves a slice of our neighbor's territory, if we are to have land enough both for pasture and tillage? while they will do the same to ours if they, like us, permit themselves to overstep the limit of necessaries, and plunge into the unbounded acquisition of wealth.'

"'It must inevitably be so, Socrates.'

"'Will our next step be to go to war, Glaukon? or how will it be?'

"'As you say.'"

At the rate with which we are now advancing in creophagy, it will not be more than a quarter of a century before deviled cat, fricasseed dog, and a variety of similar dishes will appear upon our bills of fare alongside of baked opossum, donkey sausage, and caviare, unless we adopt Haig's theory of the origin of uric acid and the extent of mischief arising from this poison, and return to a primitive diet of fruits and grains and the pure products of the earth.

PRESERVATION OF URINARY DEPOSITS.

HERETOFORE the subject of mounting and preserving urinary deposits has received comparatively little attention, perhaps from the fact that no suitable method has been discovered. Specimens of urinary deposits, when properly mounted, are an excellent means of demonstrating the various pathological elements found in urine. We are indebted to Gumprecht (*Centralblatt f. Inn. Med.; British Medical Journal*, September, 1896) for the following method, which he finds to be superior to chloroform or glycerin: A deposit is first obtained by means of the centrifuge. This deposit is then placed in a concentrated solution of corrosive sublimate and centrifugalized again. It is then washed, and preserved in a solution of formal. The hardening in sublimate may be omitted if no red blood-cells are present. If there is much albumin present, the deposit may be washed with advantage in a normal saline solution. If the urine contains urates, the deposit should be washed with warm water or a concentrated boracic solution. The washing of a deposit by means of the centrifugal machine has long been in use in the laboratory. No washing is necessary if sublimate is not used. The strength of the formal solution may vary from two to ten per cent. The author says that urinary deposits thus preserved can hardly be distinguished from fresh deposits. Cover-glass preparations may be made, but it is well to wash off the formal. The cells maintain their shape,

and the nuclei of the cells take the stain in the usual way. Casts, and especially red blood-cells, are well preserved. Fat is readily distinguished. Micro-organisms are easily recognized even when unstained. C. E. S.

ELIMINATIVE TREATMENT IN ALBUMINURIA.

So far as is known, there are no remedies which directly control the changes which take place in the kidneys. The only rational means we know of in cases of albuminuria are those which, when employed, will relieve the kidneys of the greater part of their accustomed work; namely, their excretory function. This can be done by utilizing the skin and bowels. Various means are employed to cause the patient to perspire; the following is the method employed by Carrien, of Montpelier, which he considers preferable to the vapor or hot water bath: The requirements are a bed with a cradle to raise the bed-clothes, and a spirit stove with pipe directed under them. The patient's head being outside the clothes, the rest of his body is kept exposed to the hot air (40° C.) for twenty minutes. This is repeated every three or four days. The immediate physiological effects are a not disagreeable feeling of warmth, profuse perspiration accompanied by acceleration of pulse (on an average about twenty beats per minute above the normal rate), and rise of temperature of one or two degrees. Respiration is not in the. least embarrassed. There are no ill-effects except palpitations and headache during the first baths. These symptoms last for an hour after the bath, then gradually pass off; the perspiration is the effect which lasts longest. The therapeutic effects are shown by modifications in the urine; the amount diminishes the day after the bath; then on the following day there is marked but transient polyuria, as though the kidney acted better after the short rest. The density of the urine is in inverse ratio to the amount. The urea undergoes no change. The proportion of albumin becomes much less the day after the bath, increasing on ensuing days, but not reaching the former amount. Gradually the diminution becomes persistent, and the albuminuria may even disappear. This is an excellent mode of treatment, and one which can be utilized in private practise without any great inconvenience; and when used in conjunction with a proper dietary, good results may be expected. Where the electric-light bath can be used, excellent results may be obtained with a less degree of discomfort to the patient. More thorough and complete elimination can be obtained by the use of this bath in a shorter time than in any other way we know of. The light of the bath has a very salutary influence on the patient, and the physiological effects are much more pleasant than in any other form of eliminative treatment. C. E. S.

THE STRUGGLE FOR LIFE.

The discoveries of Pasteur, Koch, and others who have devoted themselves to the development of the science of bacteriology, have brought us face to face with the fact that man is constantly surrounded by multitudes of minute and potent enemies to life, and that he is only able to prolong his existence by the maintenance of a constant warfare. How this struggle for life is carried on has been very clearly shown by Metchnikoff and others who have penetrated deeply into the mysteries of cell life, and have actually been eye-witnesses to the combat between the living animal cells and the assailing microbes. To one who has been acquainted with the properties of microbes, with the terrific virulence which they sometimes possess, and the almost incredible potency of the poisons produced by them, it is indeed a marvel that any human beings

or animal forms of any sort are able to exist. A deeper study of the subject, however, reveals to us the fact that, while man is thus surrounded by the most deadly and potent enemies of life, he is, nevertheless, by nature,—so long as he conforms perfectly to the laws of health, thereby retaining a state of physical soundness,—able successfully to resist the attacks of all known germs. This fact is very well expressed by the eminent physician and physiologist, Professor Bouchard, of Paris, who, in his epoch-making book on the auto-intoxications ("Leçons sur les Intoxications"), speaks thus upon this subject: —

"That which renders possible the development of an infectious disease is not the accidental meeting of a man and a microbe. Such encounters are constant, but are generally without result. Microbes, even the most dangerous, besiege us. They are spread about us by nature with the same prodigality with which the sea distributes the pollen of flowers and other fertilizing material, notwithstanding their reproduction is rare. Infectious maladies are thus accidental, since it is but rarely that the infectious agent finds favorable circumstances for its development and multiplication, after its penetration of the organism.

"The healthy man is not hospitable to microbes. Although constantly invaded, he reacts against them, and in this battle generally maintains the ascendancy to such a degree that even the presence of the disease is often not apparent.

"It is not the same, however, when his vitality is lowered; then his means of defense are diminished. Just as we see rushes growing upon portions of the earth where isolated circumstances prevent the natural flow of the current, so certain microbes may invade a human body the health of which is impaired, when, in consequence of some disturbance of nutrition, the chemical constitution of the organ is modified.

"It is, then, a preliminary modification of nutrition which renders infection possible. The disease is thus the result of two different processes, one of which assists the other; in fact, pathogenic processes are rarely isolated. In the immense majority of cases they are associated and combined.

"This complicity we find not only in cases of contagion, but also in the most simple maladies,—in traumatisms, for example. . . . The disorganization of the cells opens the door to infectious agents, and prepares for them material which they must destroy. In addition, the nervous elements generally become involved, and, through them, reflexes are provoked, some of which manifest themselves in the wounded part where the blood supply, the circulation, and the nutrition are all disturbed; while others react upon the entire body, causing increased activity of the heart, accelerated respiration and disturbance of tissue changes in the entire body, increasing the amount of carbolic acid and urea.

"The nervous reaction thus not only adds to the local manifestation of some special features, but associates the entire organism with the process which is in operation in the wounded part. In the same way nervous reactions nearly always give rise to other concurrent pathogenic processes. Nervous excitation, cold, and moral or traumatic shock may give rise to syncope, epistaxis, diarrhea, and polyuria. But these are not diseases. A real disease, when it is not the result of a nervous reaction, requires . . . (save in cases in which the stimulation is excessive, and those in which the nervous system is abnormally excitable) a preparatory deterioration of the body.

"In whom does a cold produce a coryza or a bronchitis? 'In everybody,' you may say. This may be, but especially in those persons whose health is permanently or temporarily disturbed, especially in persons of an arthritic or

scrofulous diathesis. In these persons you will observe that a passing nervous reaction produces lasting effects; the coryza is tenacious, but the bronchitis is opinionated. The disease may be occasioned by a nervous reaction, but it is the preparatory deterioration of the organism which facilitates its onset, and which often renders it persistent and chronic."

Remarkable Statistics. — Statistics from the board of health of the city of New York give the number of deaths from diarrheal diseases and from all causes during the past four years. The following is the table: —

Year.	Total Deaths.	Death Rate.	Diarrheal Deaths.	Disease Rate.
1892.....	5,463	38.37	1,635	11.49
1893.....	4,704	32.09	1,383	9.44
1894.....	4,531	30.05	1,197	7.94
1895.....	4,481	28.61	1,178	7.52
1896.....	4,238	26.29	973	6.04

When we consider that the city of New York has steadily increased in population during these years, and that the death-rate has diminished nearly one half, we naturally look for the cause of this great diminution in the death-rate. The president of the board of health attributes this to four principal causes; viz., clean streets, asphalt pavements in the tenement-house districts, an improved milk supply, and the increased use of sterilized milk for infants. C. E. S.

REVIEWS.

THE UNQUARANTINED PESTILENCE. — By Evan O'Neill Kane, M. D., Kane, Pa. Published at Cincinnati, Ohio.

Dr. Kane raises his voice in warning against the dangers to which innocent people are exposed through the utter neglect, on the part of the civil authorities, of the matter of the protection of the public against infection from diseases resulting from impurity. The author estimates the number of persons infected by diseases of this character at some time in their lives, to be not less than one twentieth of the entire population. He maintains that while we are insisting upon quarantine against scarlet fever, smallpox, diphtheria, and even measles and other diseases less dangerous, and are even seriously considering the establishment of quarantine against consumption, we are guilty of gross neglect in omitting to institute effective measures for the prevention of the propagation of diseases which are quite as formidable, when considered from the standpoint of their results, as any of those mentioned.

Every physician must certainly recognize the justness of the author's views; but the problem to be solved is, How can an effective quarantine be carried out without invading individual rights? and without the establishment of an institution which, under the general name of the "Contagious Diseases Act," has been, and is still, opposed on moral grounds by those whose influence and feelings in this matter must certainly be respected? It seems indeed to be just that all persons suffering from contagious disease should be placed under quarantine, and it is to be hoped that some method may be devised whereby the principle of restriction may be applied to all classes of diseases which threaten public health. We could not for a moment, however, countenance any method for such restriction which would make a distinction in the manner of dealing with men and with women.

This subject is one which should be earnestly and carefully studied. That a different method must be found than that which has heretofore been undertaken in some European cities is well shown by the report of a commission appointed for the purpose of investigating this subject in the city of Berlin, Germany. This committee has Professor Virchow at its head, and its conclusion must be considered as the result of careful scientific inquiry and mature deliberation. The following are among the conclusions arrived at by this commission: —

1. Sanitary control of prostitution, alone, is insufficient effectually to subdue venereal diseases.

2. Syphilitic infection is much more common among the inmates of brothels than among isolated or clandestine prostitutes, the number of cases of infection in brothels being nearly double in Paris, and in Antwerp six times as great. Fournier found, in 873 cases of syphilis, only seven per cent. in which infection had occurred through clandestine prostitution, and seventy-three per cent. through infection from registered prostitutes who were regularly examined.

3. The ordinary methods of examination are exceedingly inefficient, bacteriological examination showing infection to be present in a large proportion of the cases which are pronounced free from disease.

The Battle Creek Sanitarium

LABORATORY OF HYGIENE.

J. H. KELLOGG, M. D., Superintendent.
GEO. H. HEALD, M. D., Bacteriologist.
HOWARD RAND, M. D., Urinalist.
A. B. OLSEN, B. S., M. D., Pathologist.
W. A. GEORGE, M. D., Chemist.

Monthly Résumé of Work Done.

DETERMINATION OF THE CAPACITY OF THE STOMACH.

THE determination of the capacity of the stomach by the method recently described in these columns has been continued in the laboratory, in appropriate cases, with most interesting results. The conclusion reached in the article describing the method; viz., that normally the stomach has 1 c.c. of capacity to each millimeter of the person's height, is substantially confirmed by the study of a considerable number of healthy persons. We give herewith a report of the results obtained in the determination of the capacity and contents of the stomach in recent cases, and also, in connection with this data, the results obtained by chemical analysis in the same cases.

No.	Y.	Ht.	Coef.
1	2167	1828	.84
2	1983	1701	.85
3	2007	1665	1.20
4	1751	1650	1.06
5	1646	1575	1.04
6	1903	1866	1.01
7	1512	1652	.90
8	1676	1625	1.03
9	1675	1750	.95
10	1586	1728	.91
11	1655	1662	.98
12	1656	1665	.99
13	1778	1750	1.01
14	1910	1705	1.12
15	1810	1790	1.01
16	1639	1538	1.00
Average	1709	1710	1.00

The determination of the capacity of the stomach is a matter of considerable interest, from the fact that it is really, so far as we know, the only means by which it is possible to differentiate with any degree of accuracy between dilatation and prolapse of the stomach. Various means have been proposed whereby the position of the lower border of the stomach may be determined with more or less accuracy. The most precise methods with which the writer is familiar are the two which have been briefly described in this journal, and which he believes are original with himself. One of these methods is adapted to persons with a moderate amount of flesh; the other, to very fleshy persons. Briefly stated, these methods are as follows: —

1. *The Method of Determining the Position of the Lower Border of the Stomach Adapted to Thin or Moderately Fleshy Persons.* — The patient lies upon the back with the head raised by a pillow of moderate thickness. The knees are well drawn up and the feet supported on the table, so that the abdominal muscles are as perfectly relaxed as possible. The physician stands at the patient's right, placing his right hand against the patient's right side, and his left hand upon the opposite side of the abdomen. Slight movements are made similar to those employed in palpating the abdomen in ascites, or in the examination of a cyst, except that a little more vigor is used, the purpose being to agitate the fluid contents of the hollow viscera, if any of them happen to contain fluid at the time of the examination.

The whole abdomen is gone over somewhat rapidly in this manner. If fluid and air or gas are present in the stomach or colon, splashing or succussion sounds — so-called *clapotement* — are heard. This examination should be made, if possible, about four or five hours after the patient has eaten, and after the bowels have been evacuated, so that the stomach and colon may be found as nearly empty as possible. As a rule, no sounds will be produced by this sort of manipulation unless the patient

has swallowed a quantity of liquid shortly before the examination, or is suffering at the time from looseness of the bowels. All these conditions must be kept in mind, and possible errors therefrom taken into account after each examination.

If no sound is heard, the patient is made to drink one glassful of water, and the examination is repeated, the left hand working up and down the left side from within a handbreadth of the lower border of the ribs to an equal distance below the the umbilicus, and passing back and forth across the abdomen so as to oppose the movements made by the right hand in various directions and in various positions, the impulses made by the right hand being constantly directed toward the left hand while changing its position. The purpose in this is not only to produce a sound,— the so-called *clapotement*, or succussion sound,— but at the same time to catch within the left hand the fluid-wave set in motion by the right hand. A person who has a delicate sense of touch will have no difficulty in discovering instantly the impulse resulting from the movement of the liquid in the stomach, and by changing the position of the hand the lower border of the stomach may be quickly outlined.

Then, by changing the relative positions of the two hands, the examination may be extended to the right side. Very reliable information may also be obtained from the sound of the succussion wave, it being located by means of a stethoscope placed against the abdomen and moved up and down parallel with the median line of the body while the movements of the right hand are being executed as above described. The stethoscope, however, does not give as accurate information as does the impulse communicated by the wave of liquid to the well-trained fingers.

2. *The Method Applicable to Very Fleshy Persons.*— The writer has devised a plan which was first described at a meeting of the American Medical Association held at Baltimore, in 1895, whereby the position of the stomach may be determined in very obese persons, by means of a sound. This sound carries at its distal end a peculiarly constructed electrical buzzer, which is set in operation by small wires carried through the sound and connected with an alternating current apparatus. This sound, which is nothing more than an ordinary stomach-tube with an electrical device added, is introduced into the stomach in the ordinary way, the position of the lower end of the tube being, by means of the stethoscope, easily determined by the sound made. If the tube is flexible, it bends when it reaches the lower border of the stomach, and glides along the greater curvature, thus giving a very accurate idea of the position of the lower border of the stomach.

These two methods are, so far as the writer knows, the only exact and accurate ones by which the position of the lower border of the stomach can be positively determined. They do not, however, give satisfactory information concerning the position of the upper border of the stomach, and hence do not enable us to determine with any degree of exactitude respecting the size or capacity of the stomach. Information upon this point has hitherto been lacking, although its importance is very evident.

In a previous paper the writer has accurately described a chemical method developed by him, whereby it is possible to determine with as great a degree of exactness as could be desired, the capacity of the stomach. The details of this method it is not the design of this article to repeat, the reader being referred to the one which appeared upon this subject in the July number (1896) of this journal. The present purpose is simply to give the figures obtained in a number of healthy individuals, as shown in the

accompanying table (page 279), and to call attention again to the interesting fact that the normal stomach capacity is 1. c.c. for each millimeter of height.

It is evident that the capacity of the stomach must vary with the size of the individual. Weight and breadth are somewhat variable quantities, being dependent upon the amount of adipose tissue present. Height, however, is a fixed quantity; hence this is chosen as the unit of comparison. In referring to the table given, it will be noticed that in the sixteen healthy persons examined, all of whom were young men between the ages of twenty and twenty-five, the average capacity of the stomach was 1709 c.c., while the average height was 1710 millimeters. Dividing the capacity of the stomach in cubic centimeters by the height in millimeters, we have 1.00.

In examining the figures for individual cases, it is interesting to note that there are no very extreme departures from the normal proportion of 1 c.c. of stomach capacity to each millimeter in height; the figures are practically at the normal standard, nine cases being from six to twenty per cent. above, and three cases from ten to fifteen per cent. below. From these figures it seems to be apparent that the examination of a very large number of normal cases would not materially change these results; hence we feel justified in claiming the establishment of a new fact in physical proportion; viz., a definite relation between the capacity of the stomach and the height, which may be employed as a normal standard for comparison. In a future paper we shall publish some interesting observations which have been made respecting departures from the normal standard in both directions.

REPORT OF EXAMINATION OF BLOOD.

FOR OCTOBER.

Blood Count.			Men.	Women.	Total.
Over	5,000,000		5	1	6
Between	4,500,000	and 5,000,000	23	18	41
"	4,000,000	" 4,500,000	27	41	68
"	3,500,000	" 4,000,000	1	6	7
"	3,000,000	" 3,500,000	4	1	5
"	2,500,000	" 3,000,000	1	3	4
Totals			61	70	131

Hemoglobin.	Men.	Women.	Total.
100 per cent.	22	24	46
93 " "	30	41	71
85 " "	6	2	8
65 " "	2	3	5
57 " "	1		1
Totals	61	70	131

Gastric Laboratory Report for October.— Total number of analyses, 111; regular analyses, 99; experimental, 12.

The regular cases were from the following States and countries: Michigan, 39; Illinois, 13; Ohio, 10; Indiana, 7; South Dakota, 3; New York, 3; Iowa, 3; Kansas, 2; Wisconsin, 2; Missouri, 2; Minnesota, 2; Vermont, 2; Kentucky, 1; Colorado, 1; New Jersey, 1; Pennsylvania, 1; Tennessee, 1; Georgia, 1; Wyoming, 1; Texas, 1; Canada, 1; New Zealand, 1. Total, 99.

Sputum Examinations for October. — There were 30 examinations made, 25 of which were new cases. Tubercular bacilli were found in 6 cases, 4 of which were new.

Bacteriological Examinations of Stomach Fluids for October.— Total number of examinations made was 112, 9 of which were experimental.

Urinary Laboratory Report for October.— Number of specimens examined, 290; number of cases, 169. Number of cases with albumen, 17; sugar, 3; blood, 8; pus, 43; bile, 3; casts, 6.

PUBLISHERS' DEPARTMENT.

We take pleasure in calling attention to the brief description of the Colorado Sanitarium given in this number. This institution has been established especially for the purpose of giving persons suffering from pulmonary consumption a better chance for their lives than they have heretofore had. The general incurability of this disease, under ordinary conditions, is a fact so well recognized that it is not necessary to emphasize the importance of sending patients of this class to an elevated region. To seek an elevation of a mile in height has heretofore been the best possible prescription for a consumptive.

But climatic change is not the only thing needful, and for many cases other advantages are absolutely essential to recovery. Many have died under excellent climatic conditions who might have recovered, had they received the advantage of proper instruction respecting diet and exercise, and could they have had the advantage of baths scientifically administered, massage, Swedish movements, carefully graduated gymnastics, etc.

The institution established at Boulder is equipped with every possible facility for the successful treatment of chronic invalids of all classes, as well as for the management of cases suffering from diseases of the lungs. It is not a money-making concern, the entire proceeds of the work of the institution being devoted to the enlargement of the institution, the improvement of facilities, and the treatment of persons in indigent circumstances.

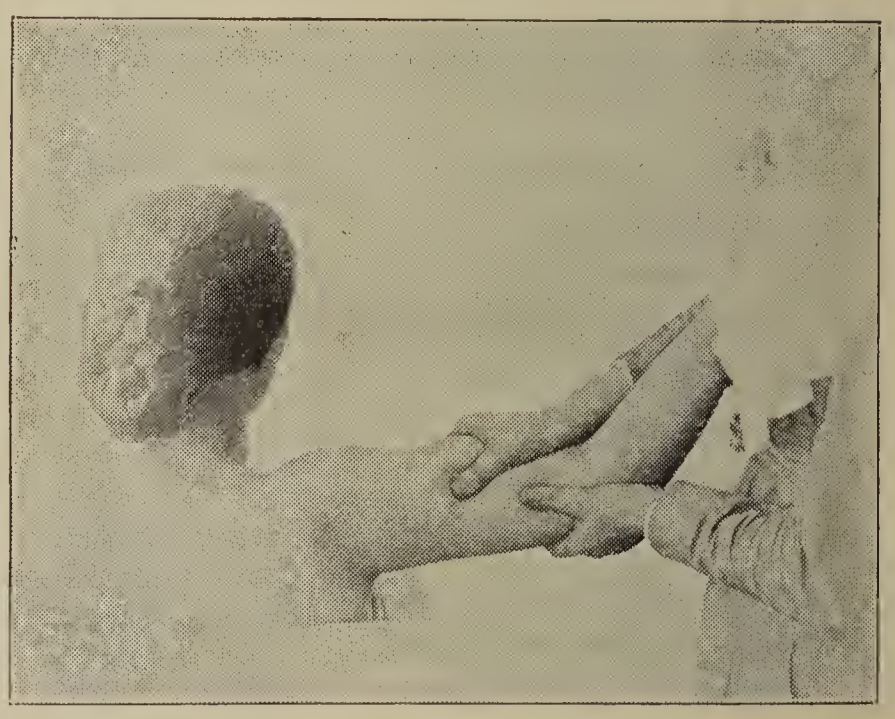
It is more than probable that nine tenths of the two hundred thousand persons who die of consumption each year in the United States might be saved by the advantages afforded by a well-equipped sanitarium in the Rocky Mountain region. The results which have already been obtained in this institution since its small beginning three years ago, and especially by the aid of its present enlarged facilities, may be fairly said to be unprecedented. We are glad to be able to report that the institution is already in a very prosperous condition, having scores of patients under treatment; but there is still room for more.

Physicians having cases requiring climatic change and sanitarium treatment, whether suffering from pulmonary or other chronic disorders, should look into the advantages of this institution before leaving their patients to die at home. Full information may be obtained by addressing the superintendent of the Colorado Sanitarium, Dr. W. H. Riley. Dr. Riley's name is already familiar to the readers of Modern Medicine as a frequent contributor to its columns, and his long experience in connection with the Battle Creek Sanitarium has admirably qualified him to conduct the work at Boulder in a thoroughly efficient and scientific manner.

The Art of Massage

Its Physiological Effects and Therapeutic Applications.

BY J. H. KELLOGG, M. D.



THIS work is eminently condensed, concise, practical, and covers the whole ground in a manner which the publishers believe will commend itself to all who are competent to judge of its merits. After a brief sketch of the History of Massage, and an outline of the parts especially concerned in Massage, the author gives in twenty pages an exceedingly lucid statement of the physiological effects of Massage, in which the subject is brought up to the latest date. The following chapter is devoted to the Therapeutic Applications of Massage, in which the general indications are clearly pointed out.

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Colorado Sanitarium

ORIGIN.

WITHIN the last ten years, the necessity for the treatment of certain classes of invalids in properly equipped sanitariums has been thoroughly recognized by the foremost and most conservative members of the medical profession ; and the need of an institution of this sort located somewhere in the Rocky Mountain region, to which physicians could send their patients, with confidence that they would receive kind and intelligent care and scientific treatment, instead of being subjected to the hardships and inconveniences of the ordinary hotel or boarding-house, has frequently been discussed at the annual meetings of the American Climatological Association and various other medical bodies.

For more than twenty years the managers of the Battle Creek Sanitarium have been sending certain classes of patients, particularly cases of consumption, to various points in the Rocky Mountains, to give them the benefit of the well-known climatic advantages of this portion of the United States. The excellent results observed in these cases, under conditions not in all respects the most favorable, have led to the belief that if to this climate could be added the advantages of such care, regimen, and training as are afforded by a first-class sanitarium, still greater and better results might be obtained, and for several years the philanthropic association which thirty years ago established the Battle Creek Sanitarium, has been investigating the merits of the various localities in the Rocky Mountain region, from Wyoming to Old Mexico.

LOCATION.

When it became generally known that the establishment of such an institution in the Rocky Mountain region was contemplated, the promotors were overwhelmed with letters from all parts of this great region, setting forth the special merits of various localities, some of which are already well known to the public, and others which have been less generally advertised.

The leading localities were personally visited by the president of the board, or by special committees appointed for the purpose, and careful comparison made of the respective merits of the various points brought forward for consideration.

In the selection of a locality, special attention was given to the following points : —

1. Altitude. Experience has shown that the altitude of an institution of this sort should be about one mile, or a little more than five thousand feet.

2. Equability of temperature. This required a location near the foot-hills, to avoid, on the one hand, the excessive summer heat of the plains, and on the other, the trying blizzards of winter.

3. Scenic advantages, as a sort of entertainment, and an inducement to exercise and rec reation.

4. A location easily accessible, with not too precipitous mountainsides, so as to afford opportunity for exercise in climbing carefully graduated paths on foot or horseback.

5. Ready accessibility by rail.

6. Close proximity to a city, to secure the advantages of an organized community.

7. Protection from the high winds which prevail at certain seasons of the year in mountainous regions.

8. A sterile or non-infected soil, and a locality free from tubercular disease.

Numerous localities were found which supplied two or three of these desiderata, but it was not an easy task to find a single locality presenting in a high degree all these important features. After a long, patient, and expensive investigation, the committee appointed for the purpose of opening this new enterprise finally fixed upon the vicinity of Boulder, as, on the whole, the most desirable location in the entire Rocky Mountain region.

The committee was assisted in making its selection by the fact that it was found that a large proportion of the patients recommended by the Sanitarium management to visit the Rocky Mountain region, sooner or later, without special recommendation or concerted action, found themselves at Boulder; so that, after a time, there was to be found in that city quite a large colony of these exiles. The colony continued to grow until a demand was made for a boarding-house, where proper diet and nursing could be secured. A considerable number of the citizens of Boulder joined with the invalids in this request, and three years ago, a so-called sanitarium boarding-house was opened in a building hired for the purpose. This little institution soon outgrew its small quarters, making it necessary to hire several additional cottages; and in a year the number of invalids so increased that a physician was demanded and supplied. Within a month it became evident that much larger provisions must be made for the accommodation of the large number of invalids who were applying to them for care and treatment.

Dining-Room.

The committee having selected the site now occupied by the Colorado Sanitarium, it was purchased, and steps taken for the erection of suitable buildings. The Eastern friends of the enterprise contributed about sixty thousand dollars for this purpose.

First of all, two fine, large, three-story, brick, steam-heated cottages were erected. While the main building was in process of erection, these were quickly filled; and as rapidly as rooms could be finished off in the main building, they were also filled with patients, so that at the dedication, July 1, 1896, there were very few vacant rooms in either main building or cottages.

Thus it will be seen that the Colorado Sanitarium is the natural outgrowth of circumstances indicating a real and positive demand.

Colorado has a world-wide reputation as the Switzerland of America. Its Alpine peaks, its picturesque gorges and cañons, are scarcely surpassed even in Switzerland, while its climatic advantages are vastly superior to those of the Little Republic. The dryness and purity of the air, with the almost perpetual sunshine, have saved the lives of thousands who to-day testify by their active usefulness to the virtues of this wonderful climate.

One of the Parlors.

The special purpose of the promoters of the Colorado Sanitarium has been to establish an institution at which chronic invalids, especially those suffering from pulmonary tuberculosis, or consumption, may secure the best possible advantages in the recovery of their health,— advantages by the aid of which complete recovery may be expected in nearly all cases in which the disease is still in its incipient stages, and even in a great majority of those in which the malady has made considerable advancement. During the few years which have elapsed since the small beginning of this institution, the number of patients treated has been sufficiently large, and the success of the measures employed sufficiently great, to furnish foundation for the statement that by the combination of the climate with sanitary advantages, the proportion of cures can be greatly increased.

The institution is not, however, wholly devoted to the treatment of consumptives. It is, like the various other institutions of the same character which have been established under this management, not a money-making enterprise, but a self-supporting philanthropy. The entire profits from the work of the institution will be forever devoted to the improvement of facilities and the treatment of the worthy sick poor.

The city of Boulder is situated a little north of the center of the State of Colorado, twenty-nine miles by rail from the city of Denver, at the entrance of the famous Boulder cañon and two other fine cañons. It is near the far-famed Estes Park, and is surrounded by numerous beautiful mountain lakes, which abound in this region as in no other part of Colorado. It is supplied with an abundance of the purest water, from never-failing sources in the snow-capped peaks.

The Sanitarium buildings are located just in the edge of the city, upon a site of one hun-

dred acres, consisting of two distinct portions, — a gently sloping hillside, and a splendid mountain with peaks and crags and strange, fantastic geological formations resembling those of the far-famed Garden of the Gods. The surroundings are the grandest to be found in Colorado. Lofty mountains tower up almost from its very doors, and the invalid may, in a day's travel up the sides of these mountains, find all the varied climates, from the temperate zone to the Arctic circle. Beautiful cañons and streams of mountain water are on every hand, and this, too, within an hour's ride of Denver, the metropolis of the Rocky Mountain region.

BUILDINGS.

The main building of the institution is one hundred feet in length, and sixty-six feet in width, with a large rear extension. It is constructed with special reference to its use as a sanitarium, thoroughly ventilated, heated by steam and open grates, lighted by electricity, supplied with elevators, electric call-bells, and all modern hotel conveniences. A unique feature is the location of a large, sunny parlor and a capacious dining-room at the top of the building. The kitchen is also located at the top, so that the building is absolutely free from kitchen smells. The drainage and sewerage are perfect, and careful attention has been given to the maintenance of thoroughly aseptic conditions. Altogether, it is believed to be the most perfect structure ever erected for the purpose for which it is designed.

METHODS.

The methods of treatment employed in the institution are such as have been thoroughly tried, and have proved their efficiency in the successful treatment of thousands of cases of chronic disorders in the other institutions conducted under the same general management as the Colorado Sanitarium.

The physicians who are connected with the institution are men and women who have been regularly educated in the best medical schools of the country, with the additional advantage of post-graduate training, and who have had a broad experience in sanitarium work. The medical work of the institution is conducted in harmony with the ethics of the profession, and on strictly scientific principles.

A Private Room.

TREATMENT APARTMENTS.

There are two sets of treatment apartments, one for ladies and one for gentlemen ; medicated-air rooms, and other departments for special treatment in all the different lines of medicine. All forms of baths are given, including the electric-light bath, massage treatment, manual Swedish movements, and electricity in every form. In the medicated-air rooms those suffering with bronchial, asthmatic, and other lung troubles can live, if necessary, in an atmosphere particularly adapted to their condition,— an arrangement which affords one of the very best means of medication in all classes of diseases of the respiratory organs.

DIETARY.

In the treatment of all forms of chronic disorders, careful attention to the nutrition of the patient is of fundamental importance. This is emphatically true of those who are suffering from disease of the lungs in any form. Without doubt many cases of pulmonary consumption begin, and are aggravated after the disease is established, by disorders of the stomach and digestive system. The preparation of food and the regulation of diet in each case are matters which receive first attention at the Colorado Sanitarium.

PHYSICAL TRAINING.

The institution is provided with a commodious gymnasium, where, under a trained director, each patient is put through a course of training for the purpose of increasing his breathing capacity, strengthening his heart, and developing his muscular system generally. This forms an important part of the daily program of the average patient. Other cases which seem to need it are put upon the rest-cure, with appropriate treatment.

Throat and Lung Department.

MEDICAL DEPARTMENTS.

Although the prime purpose in the organization of the institution was to provide an establishment in which persons suffering from pulmonary ailments might enjoy, together with the best climatic advantages, the benefits to be derived from all the resources of modern medical science, the management wish it to be distinctly understood that the work of the institution is not exclusively confined to this class, but that the most superior facilities are af-

forded for the treatment of all classes of chronic ailments. Special departments are maintained for the treatment of diseases —

Of the nose, throat, and lungs.
Of the digestive system.
Peculiar to women.
Of the nervous system.
Of the eye and ear.

Persons with incurable diseases and those which cannot be promptly associated with other patients are not received. The location of the institution has been especially selected with reference to the freedom of the soil and air from infection; and the strictest rules and precautions are observed with reference to the maintenance of this condition. Through the neglect of such precautions, localities once free from tubercular germs have become so thoroughly infected as to cause infection of the well, as well as the reinfection of those who have once recovered. Persons who decline to observe the rules and precautions considered essential are not allowed to remain in the institution.

SURGICAL DEPARTMENT.

In addition to the foregoing, the institution includes a well-appointed surgical ward, with modern appliances, and trained nurses, where thorough asepsis is carried out.

The departments of medical and surgical work are under the supervision of physicians who have had ample preparation for, and a broad experience in, their several lines of work.

LABORATORY OF HYGIENE.

Connected with the sanitarium is a laboratory of hygiene, where bacteriological, microscopical, and chemical work is carried on according to the most approved methods. In this laboratory, examinations are made of the blood and urine of every case which applies for treatment, as an important aid in diagnosis, and bacteriological examinations are made of the sputum of all cases that expectorate.

SOCIAL LIFE.

The social life at the sanitarium is wholesome and cheerful. All connected with the institution as employees are believed to be Christian men and women, and conscientious in their efforts to relieve the suffering. An atmosphere of good cheer and contentment pervades the institution.

RATES.

The rates are moderate, varying from $1.75 to $4 a day for board, room, and general treatment, with bath attendant and medical attention. A moderate extra charge is made for special nursing and for office treatment.

General examination, $5.

For further information, address

W. H. RILEY, M. D., SUPT.,
Or, COLORADO SANITARIUM,
BOULDER, COLO.

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DIRECTORY OF SANITARIUMS.

THE following institutions are conducted under the same general management as the Sanitarium at Battle Creek, Mich., which has long been known as the most thoroughly equipped sanitary establishment in the United States. The same rational and physiological principles relative to the treatment of disease are recognized at these institutions as at the Battle Creek Sanitarium, and they are conducted on the same general plan. Both medical and surgical cases are received at all of them. Each one possesses special advantages due to locality or other characteristic features.

ST. HELENA SANITARIUM, OR RURAL HEALTH RETREAT,

ST. HELENA, CAL.

W. H. MAXSON, M. D., Superintendent.

IRVING E. KECK, Business Manager.

THIS institution is beautifully located at the head of the Napa Valley. It is a fine large building, with excellent appointments, and all facilities required for the treatment of chronic invalids of all classes. It has also a record for a large amount of successful surgical work. There are several able physicians connected with the institution. The scenery is delightful, the climate salubrious; the water supply, which is furnished by mountain springs, is pure and abundant. Hundreds of cases of diseases generally considered incurable have been successfully treated at this excellent institution during the twenty years of its existence.

CHICAGO SANITARIUM,

28 COLLEGE PLACE, CHICAGO, ILL.

THIS institution is a branch of the Battle Creek (Mich.) Sanitarium. It is favorably located near Lake Michigan, in the southern portion of the city, close to Cottage Grove avenue, and facing the old Baptist University grounds. A few patients are accommodated. Facilities are afforded for hydrotherapy, and the application of massage, electricity, Swedish movements, and other rational measures of treatment.

NEBRASKA SANITARIUM,

COLLEGE VIEW (LINCOLN), NEB.

A. R. HENRY, President.

A. N. LOPER, M. D., Superintendent.

COLLEGE VIEW is a thriving village located in the suburbs of Lincoln, with which it is connected by an electric railway. College View is the seat of Union College, one of the leading educational institutions of the West. The Sanitarium has a beautiful location, facing the spacious college grounds, and gives its guests the advantages of a quiet, homelike place, combined with appropriate and thoroughly rational treatment. It has a full equipment of excellent nurses, and has already won for itself an enviable reputation in the West.

PORTLAND SANITARIUM,

PORTLAND, ORE.

L. J. BELKNAP, M. D., Superintendent.

THIS institution is beautifully located in the center of the city, in a fine building with spacious grounds; and although it has been in operation scarcely more than a year, it already has a good patronage, and has evidently entered upon a successful career. Facilities are provided for the dietetic and medical treatment of chronic ailments of all kinds. The advantages for treatment include, in addition to various forms of hydrotherapy, electric-light baths, and apparatus for the application of electricity in its various useful forms, manual Swedish movements and massage.

COLORADO SANITARIUM,

BOULDER. COLO.

W. H. RILEY, M. D., Superintendent.

THIS institution is located on a beautiful site of one hundred acres, including a fine mountain peak, and commanding extensive landscape views which, for variety and beauty, can hardly be equaled. The site adjoins the thriving city of Boulder, and is about one hour's ride by rail from Denver, the streets and principal buildings of which are easily discernible from the peaks around Boulder. The equipment consists of a large building especially erected for the purpose, two fine cottages, and every appliance for the application of hydrotherapy, and for the special treatment of pulmonary ailments, to be found in the best establishments of like character. Particular attention is given to the dietetic treatment of patients, and to systematic exercise, in addition to the special treatment for specific ailments. The altitude is between five and six thousand

Directory of Sanitariums.—Continued.

feet, just that which has been determined to be the best for pulmonary troubles. Though but a few months have elapsed since the work of this institution was fairly begun, a large number of persons suffering from pulmonary tuberculosis have already been cured, and are now rejoicing in sound health. The rational hygienic treatment, with the climatic advantages, has proved effective in the cure of cases which, without the combined advantages of these superior measures, must certainly have succumbed to the disease.

GUADALAJARA SANITARIUM,

STATE OF JALISCO, MEXICO.

D. T. JONES, Superintendent.

ADDIE C. JOHNSON, M. D.,
J. H. NEALL, M. D., } Physicians.

THIS institution, established in 1894, is the first and still the only one of the kind in Mexico. It affords, in addition to the unsurpassed climatic advantages of the region in which it is located, facilities for the employment of hydrotherapy, electricity, massage, manual Swedish movements, and dietetics, in the treatment of all forms of chronic disease. The altitude is the same as that of Denver,—from five to six thousand feet. Guadalajara has the advantage of a climate more nearly uniform than any other with which we are acquainted. Located in the tropics, it enjoys almost perpetual sunshine, while its altitude is such as to prevent excessive heat. There is probably no better place on earth for a pulmonary invalid. It is only necessary that the advantages of this institution should become known to secure for it extensive patronage.

INSTITUTE SANITARE,

BASEL, SWITZERLAND.

THIS institution affords the only place in Europe where patients can receive the advantages of a thoroughly hygienic diet, baths, electricity, Swedish movements, massage, and various other methods of treatment, applied after the manner and in accordance with the same principles which govern the Battle Creek Sanitarium and its several branches. The physicians are persons who have received a thorough training in the institution at Battle Creek. Terms are moderate. No better place for sick persons or semi-invalids abroad than the Institute Sanitare.

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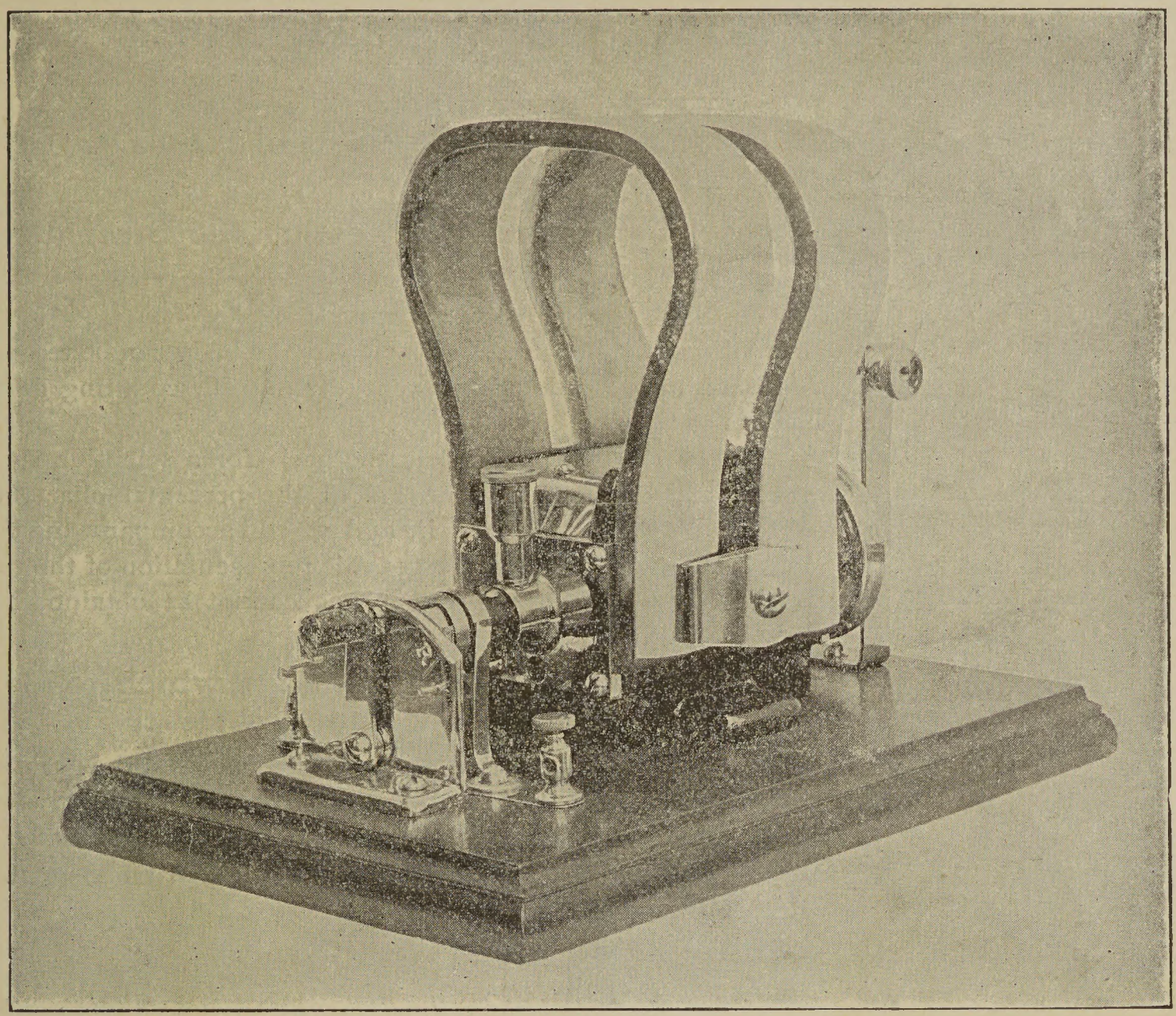

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Some sort of motor is of course required to operate it. Any of the above motors will be found satisfactory, but the most satisfactory arrangement of all is, of course, the electric motor, operated by an electric-light system, which is constant and always ready for use.

The sinusoidal machine can now be promptly furnished without motor, or with any of the different motors named above, carefully boxed and delivered at the express office. A full set of directions is sent with each apparatus.

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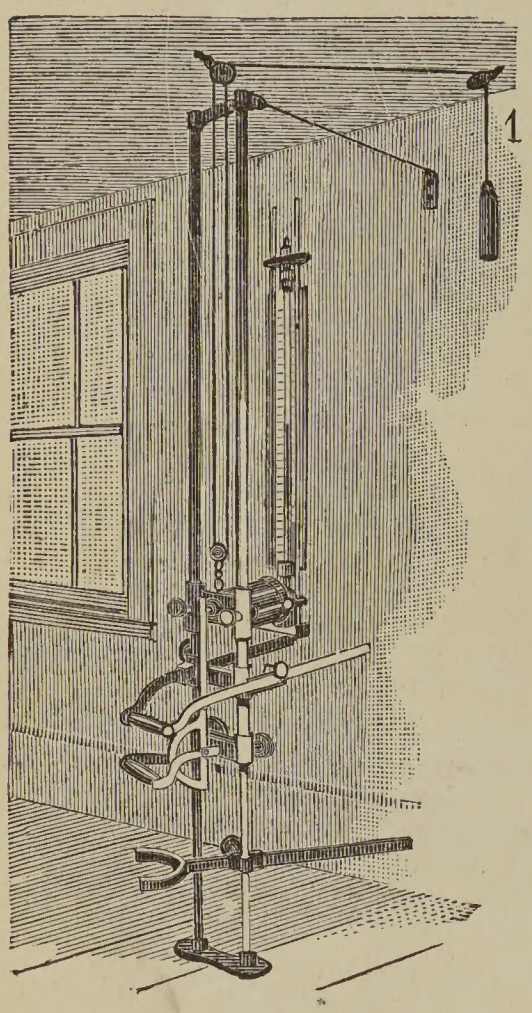

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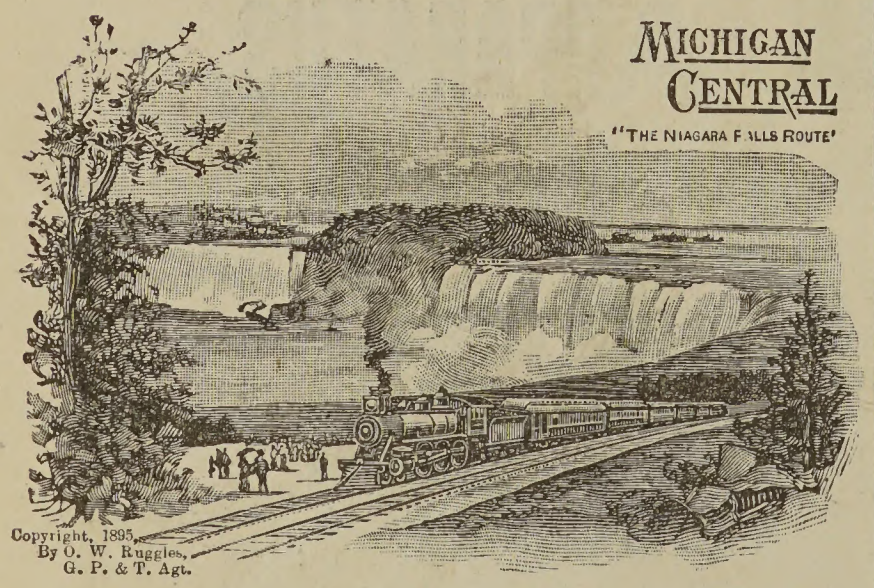

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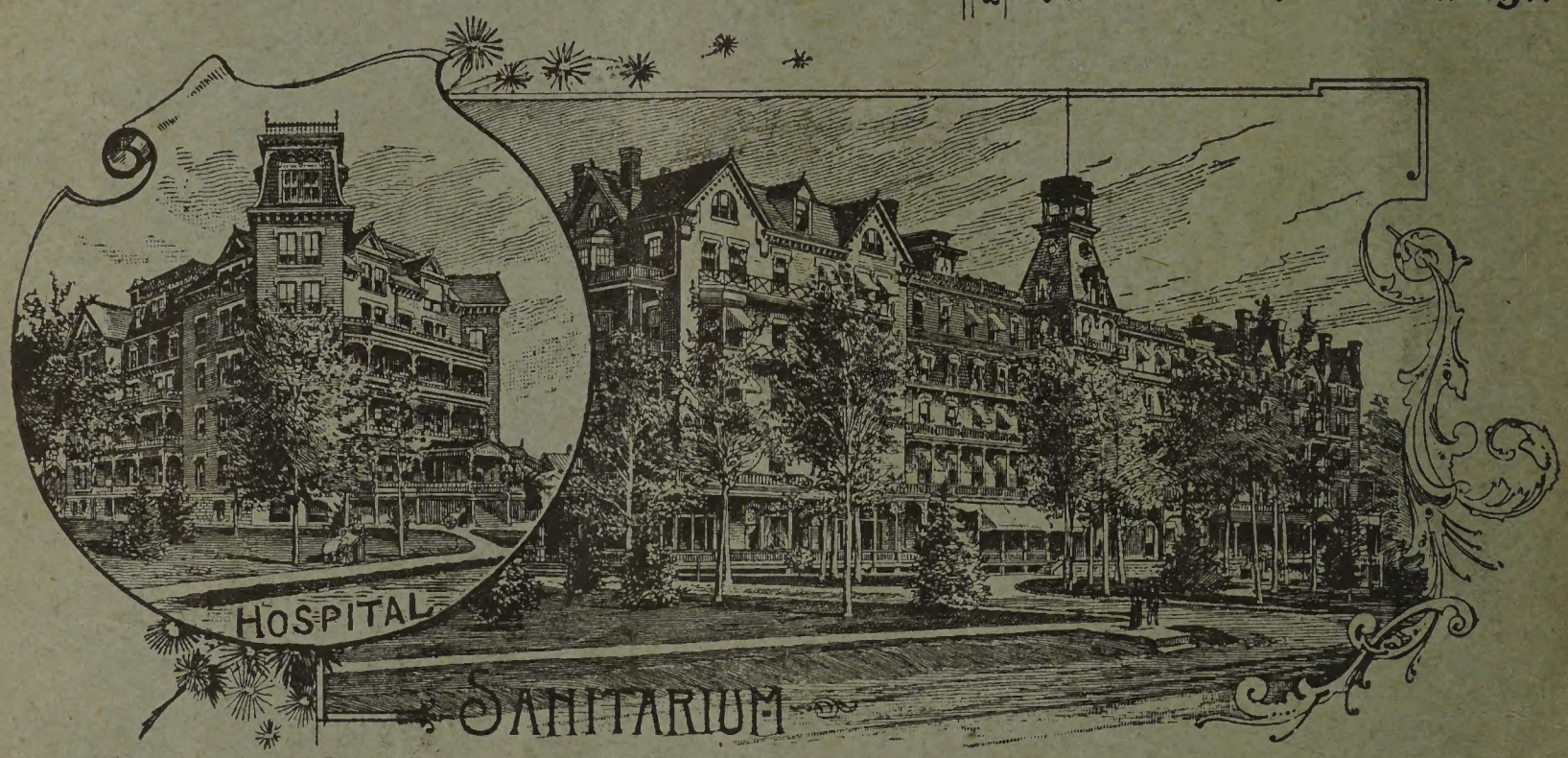

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